

OUR OWN UNITED STATES

WALTER LEFFERTS



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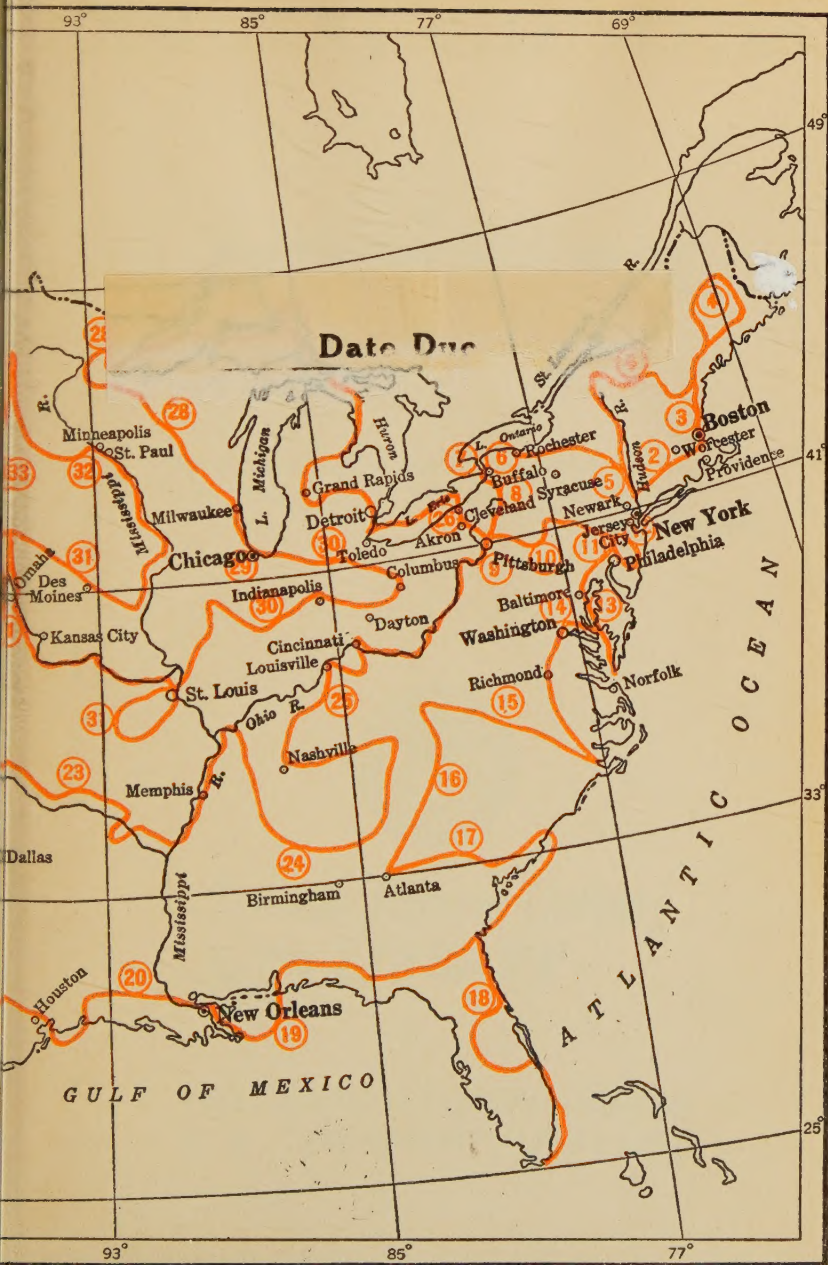
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OUR OWN UNITED STATES

BY

WALTER LEFFERTS, PH.D.

AUTHOR OF "AMERICAN LEADERS" AND "OUR COUNTRY'S LEADERS"

ILLUSTRATED

"For the glory of the Present is to make the Future free,
I love my land for what she is and what she is to be."

—Henry Van Dyke.



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PREFACE

THERE is nothing like travel for broadening our horizons, our sympathies, and our enjoyments. Even "tarry-at-home travels" are far better than no travels at all. This book is planned to make children wish to see this great land of ours and to give them the feeling of actual travel. It avoids the dullness and dryness of so many text-books that follow the so-called "scientific" method, and has omitted numerous statements which lack value or appeal to pupils of ten to fourteen years. While foreign commerce, for example, is touched in many places, its lengthy discussion is intentionally omitted; so are many other topics which the "grown-up" text-book thinks necessary to include. I have written this volume with the child first in mind and the subject second.

American children, Ruth and Alice, Fred and Jack, are supposed to be taken over the continental United States on a continuous journey which covers every state at least once, and touches nearly every important city. They travel by steamboat, train, automobile, and airplane, thus gaining an idea of many water routes, railroad lines and motor highways. Especial notice is given to those wonderful playgrounds, our unsurpassed national parks. To arouse in our children feelings of curiosity, wonder, and love of the beautiful in nature is no less a duty than it is to supply them with knowledge.

Especial effort has been made to give color to the pages. An apt characterization of a scene or of a condition has often supplanted a tiresome description of some industrial process. Most of us need only know results or the broadest possible statement of the steps which secured those results. It will be found, however, that the statements of the book are

climbed together by constant back-reference. Questions and suggestions for fruitful activity on the part of the pupil are found at the end of each chapter; they demand re-reading of the text as well as reference to maps and outside source-books. By proper selection, these suggested activities can be made to suit various grades of ability.

Finally, this book aims to be human. We have missed much in geographical study because we have not linked it with its natural mate, history. These chapters recognize that mating. Moreover, little stories of noteworthy men catch the pupil's attention and give him new friends. There is also a wonderful source of vital geographical ideas which has remained almost untouched; that is in modern literature. Ideas drawn from that source are strong and steadfast. At the ends of the chapters, therefore, are references to stories which by the fascination of narrative will vitalize the idea. Is this volume a human book? Try it on the children and see.

I am indebted to Mr. John T. Faris for permission to use illustrations from his well-known travel-books, and I gratefully acknowledge the valuable suggestions of my friend Professor Alfred Gary White of the University of Pennsylvania.

WALTER LEFFERTS



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OUR OWN UNITED STATES

CHAPTER I

THE GIANT CITY

On Manhattan Island.—We are starting off for a tour of this big country of ours, and Ruth and Alice, Jack and Fred, invite you to join us. Our train is speeding across the New Jersey meadows. All at once it seems to dive under a hill into the dark, and a queer feeling comes into our ears. "You are now in the tunnel under the Hudson River," says the conductor. When the train stops, we find ourselves still so deep underground that we must climb three long flights of steps before we can leave the enormous Pennsylvania Railroad Station; but soon we stand on Broadway, one of the most famous streets of the world, and know that we are right in the midst of New York City.

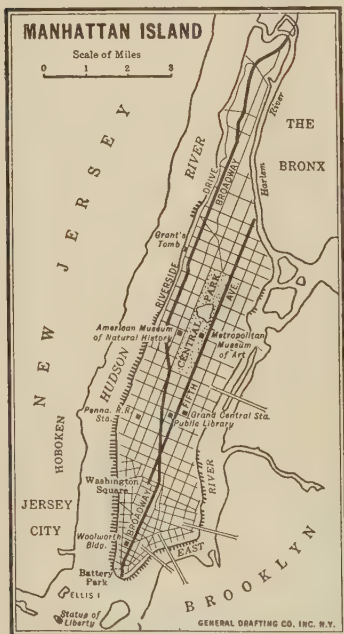
It is lunch time, and Broadway, which is not so broad after all, is just packed with people. Ruth thinks that "Busyway" would be a better name than Broadway. Somehow we twist our way southward through the crowds, between rows of high office buildings, until we come to one which reaches farther toward heaven than any other. This is the Woolworth Building, the tallest business structure in the world, containing four thousand offices. Let us take the elevator and ride up, up, for fifty-seven stories, until we can look far out over the great city which we are visiting. The view gives us a key to part of New York's life.

Gazing from the tower, we notice that we are on a narrow strip of land. To the east is a strait called the East River, on the west is the Hudson or North River, and

these waters come together into New York Bay. Our strip of land is really the Island of Manhattan, and Fred's keen eyes can see, far northward, the Harlem River which helps the East River and the Hudson River to make Manhattan an island.

Manhattan Island once contained every bit of New York City, but now the city takes in the Bronx, which is north of the Harlem River, all of Staten Island and the western part of Long Island, including the big community of Brooklyn. Here live nearly six million people, making New York the largest city in the United States, and it is still growing fast. "How did New York come to be such a giant?" wonders Alice.

Why Did New York Grow?—Well, to begin with, New York has one of the largest and best protected harbors in the world. A single look at the map will give you a good idea of the various inland water ways around New York at whose wharves



vessels may load and unload. Then, New York also possesses a fine water-trail into the "back country." Here is the beautiful Hudson River, so deep that large vessels may go up and up for one hundred and fifty miles. The settlers along that water-trail sent down quantities of goods to load the ships of New York harbor and bought

quantities of goods which those ships brought in. Thus, the Hudson River helped to support the growing city.

Furthermore, where the Hudson grows too shallow for vessels, there flows into it another river named for the



The tip of Manhattan Island at Battery Park. The round building in the foreground is Castle Garden, once a "castle" or fort, now the city aquarium. In the left background is the Woolworth Building.

Mohawks, that tribe of the fierce Iroquois Indians. Along the Mohawk River trail came first a road and then the railroad for this was the best path that anyone could find through the mountains along the whole length of the Appalachians.

By this path travelers reached the Great Lakes easily. Along this trail, as the western part of New York State was settled, De Witt Clinton built the Erie Canal, which carried the farm products of the new West down the Mohawk Valley and the Hudson Valley to New York City—and then New York City grew faster than ever.

It is easy to see, then, that New York could not help growing like Jack's beanstalk, for everything combined to that end. The bigger the city grew, the more vessels came to the port, and the more wharves were built. Now almost all the important steamship lines on the Atlantic Ocean centre at New York, and New York leads all the American ports in foreign trade.

The many steamships that come to New York have brought millions of foreign people. Because New York was such a big city, a great number of these foreigners decided to stay there to make a living. Today New York is the most foreign city we have. Scores of different languages are spoken there. Four out of every five New Yorkers were born abroad or are the children of foreign parents. Thirty daily newspapers in foreign languages are printed in New York. Whole sections of the city look and sound like foreign lands. New York is the place where Europe and America meet and mingle.

A Crowded Centre of Life.—The life of New York centres on Manhattan Island. There are the offices of the men who handle the big business of the world, there are most of the book publishing companies of our country, there live a great number of the leading artists, writers, and theatrical people. Office buildings are everywhere. There are many trades carried on in the island, the chief ones being those which concern clothing and its ornaments, for New York makes one-half of the clothing of the United States and

employs two hundred thousand people in doing this. There are many apartment houses in each of which live hundreds of either the rich or the poor, but because land is so dear, few people of Manhattan can afford to own their homes.

So crowded has the island become that it really cannot be the home of many more people. As fast as some come



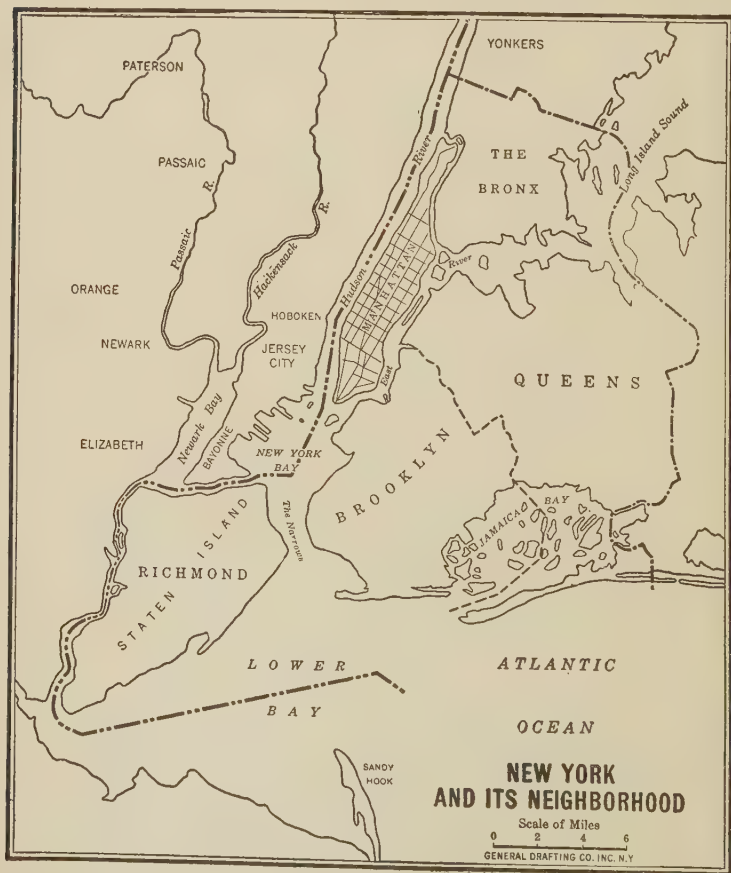
Broadway and Seventh Avenue. Times Square, New York City.

in, others find homes elsewhere. Thus, in the morning a couple of million people rush into the Island from all directions, and rush out again at night. Crowding is the keynote of Manhattan. This has made land so dear that it is cheaper to build very high buildings than to buy extra land, and New York has the greatest collection of "skyscrapers" and tall apartment houses in the world.

New York's Jersey Neighbors.—"From this tower," says a kind-looking gentleman who has been listening to our talk,

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"you can see the smoke of many New Jersey cities which are within easy reach of New York. There, just across the Hudson, are Jersey City and Hoboken, where many rail-



roads end, and where many steamship lines have their docks. South of Jersey City, on that tongue of land between New York Bay and Newark Bay, is Bayonne, with its big coal-

shipping docks and oil refineries. At the head of Newark Bay perhaps you can see Newark itself, one of the greatest manufacturing cities of our country. Newark's manufactured goods are worth more than those produced by many and many a whole state.

"At the foot of Newark Bay is the pleasant city of Elizabeth, which sends sewing machines over the whole world. On the hills west of Newark lie beautiful home towns, and on the Passaic River to the north are the manufacturing cities of Passaic and Paterson. If you are wearing silk in any way, it may have come from Paterson, for that place weaves more silk than any other United States city." How many important places New York City has for neighbors! They all add in some way to the prosperity and importance of the giant city near them.

From the Battery to Central Park.—But we have looked long enough from our high post. Let us go down to the end of Manhattan, where, along the harbor, we find Battery Park. Out there in the bay, on a small island, is the famous Statue of Liberty, the largest bronze statue in the world, presented to the United States by the French people as a token of friendship. As immigrants come toward New York their eyes fall upon this giant woman holding aloft her torch to enlighten the world. It is a sign that America is a land of hope. Nearby in the harbor is Ellis Island, where the immigrants must land to be examined, for Uncle Sam wishes to keep out anyone who will be a burden and not a help to this country.

Now we go northward to Washington Square, and through the beautiful Washington Arch we see a fine, wide avenue leading us toward the heart of Manhattan—it is Fifth Avenue, one of the magnificent streets of the world. From the roof of a motor bus we survey the fine shops. After

a time the marble lions at the entrance of the Public Library come into view. This library is the greatest in our country except the Congressional Library at Washington. Soon we arrive at Central Park, large and beautiful, which is really central, a playground and breathing-spot in the midst of city streets.

Instruction and Pleasure.—In the park is the great Metropolitan Museum of Art, filled with the best which artists of ancient and modern times could create. We cross the park to the American Museum of Natural History, with wonderful collections of minerals, insects, and reptiles, and groups of birds and beasts. We can scarcely get the boys to tear themselves away from the specimens which Theodore Roosevelt brought back from Africa. Next we go to Riverside Drive, overlooking the ebb and flow of the Hudson, and, passing its fine apartment hotels, we come to the temple-like tomb of General Grant, high above the water. Not far away is Columbia University, one of the largest in the world, to which many thousands of students resort both winter and summer.

It is evening now, and we are ready to rest in one of the many great hotels; but before we go to bed we must have a glance at the "Great White Way." That means Broadway, in the theatre district, which centres at Forty-second Street. Here high in air blaze enormous electric signs, each one glowing with thousands of lamps. Lower down, places of business and amusement try to outdo each other in their brightness. Night is turned to day. "The light seems to draw people like moths to a flame," observes Jack. The big electric advertisements seem to move and dance to call our attention. Nowhere else in the world is such a sight. Our last thoughts of the giant city are those of light, of crowds, of business and pleasure combined.

QUESTIONS AND SUGGESTIONS

1. From looking at the map, name the waterways which centre about New York City.
2. From advertisements in magazines or newspapers find three steamship lines which bring passengers to New York. From what parts of Europe do these steamships come?
3. Make a list of New York's neighbor cities.
4. If you worked on Manhattan Island, would you rather live on the island or outside of it? Why?
5. How many stories has the tallest building in your town or city? How does it compare with New York's tallest building?

CHAPTER II

THE WORKSHOPS OF NEW ENGLAND

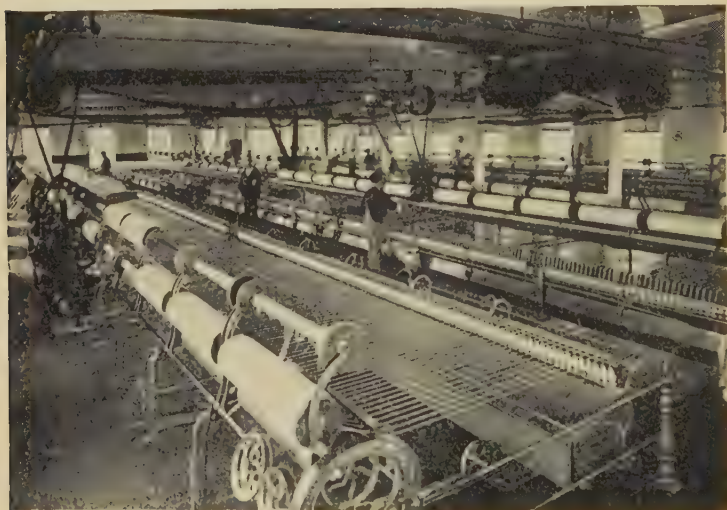
How New England Grew.—Now we are going eastward to visit New England. If from some height in the clouds we could see all the inhabitants of this country assembled at once in the various states, we should notice in a bunch or cluster three states that were particularly swarming with people; these states, Connecticut, Rhode Island, and Massachusetts, compose the southern part of New England. No other states except New Jersey are so thickly settled. Let us find out why this part of New England has so many people and how these people live.

Although the early settlers of New England tried to farm the land, they found it not very good for that purpose. Most of it was hilly, with stony and thin soil. The best land lay in the valley of the largest river, the Connecticut; elsewhere, rich fields were hard to find. It is true that much less than a hundred years after the Pilgrims set foot on Plymouth Rock, New England was the most thickly peopled part of America, yet that was not on account of her good soil.) The colonists turned to the ocean, they caught its fish and its whales, and sailed on trading trips with lumber and salt cod. The sea was more of a friend to them than was the land.

“The roughness and the rockiness of the ground had some advantage, didn’t it?” asks Fred. Yes indeed. Over the ledges of rocks came merrily tumbling many swift streams and at the falls or rapids of the streams saw-mills and grist-mills, driven by the water-power, sprang up. Around these mills there grew villages, and many of the villages blossomed into towns.



Two Cotton-mill Districts.—After the Revolution, the New Englanders wished to make their water-power run cotton-mills, but Old England would not show them how. Finally Samuel Slater, who knew the precious secrets, stealthily slipped away from England, came to America in answer to an advertisement, and set up a mill at the Falls of the



A scene in a New England mill. By these big machines, a few persons can do a great deal of work.

Pawtucket River. Soon the streams of New England were driving many cotton and woolen mills. Pawtucket, where Slater's mill was built, is now the second largest city in little Rhode Island, and is still an important cotton manufacturing centre, although somewhat overshadowed in that respect by her big near neighbor, Providence.) Just think—half the people of Rhode Island are crowded into these two adjoining cities.)

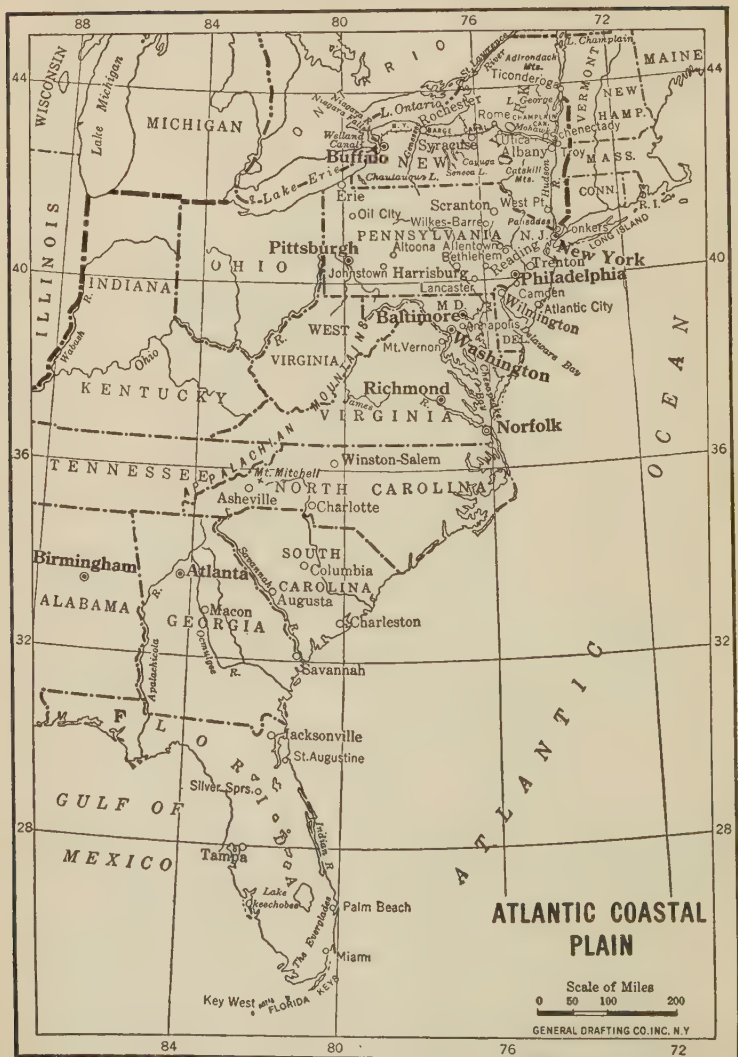
Two other important cotton-mill cities are nearby. We can go by boat on Narragansett Bay from Providence to

Fall River, Massachusetts, which is the most important cotton-weaving city of the Union. A trolley line will take us on to New Bedford, once the home port for sturdy American whaling vessels, but now rivaling Fall River in mills. These four cities, Pawtucket, Providence, Fall River, and New Bedford, with smaller surrounding towns, make up one cotton-mill district. (For the other principal district we must go northward to the Merrimac River, of which Whittier sang so lovingly. It turns more factory wheels than does any other river in the world. After serving the mills of Manchester, in New Hampshire, it flows on into Massachusetts, where, at Lowell and Lawrence, woolen mills begin to be neighbors to the huge cotton mills.

Selling Yankee Skill.—About half the cotton cloth of our country is made in New England, and more than half of the woolen cloth. Our own land supplies almost all the cotton for the cloth, but every important sheep-raising country sends cargoes of woolly fleeces as raw material for the woolen mills. Think of the miles and miles of cloth that pour out from the clattering looms of only one factory—and there are hundreds of such factories in New England. These mills need so much power that they can get only a part of it from the falling water; but because water-power, or “white coal,” is the cheapest power, the mills use it as much as possible.

It was the cotton and woolen mills that made southern New England a manufacturing district, but the “Yankees” did not stop there. They made a business of selling the cleverness of their heads, the skill of their hands, and the power of their machinery—that is, they developed manufacturing to a high degree. They bought cheap iron and steel from Pennsylvania and made it into valuable bicycles, fire-arms and machinery. They bought cheap copper bars from the west and made them into electrical supplies and brass.

OUR OWN UNITED STATES



From that brass they stamped out parts of clocks and put them together by the million. From raw silver and gold they made beautiful silverware and jewelry. From foreign rubber they made overshoes, raincoats, gloves, and tires. New England mines no coal, but her manufactures pay for coal to run the factories a thousand times over.

Thus, southern New England supports herself upon her poor soil, by making over cheap material so that it takes a valuable shape. Worcester in Massachusetts makes complicated looms for the mills. Connecticut produces most of the hardware of the United States. "I certainly have heard of Yale locks and Waterbury watches," exclaims Alice. New Haven, Bridgeport, and Hartford are producers of electric machinery and electric fixtures. The electric lamp by which you read may have come from New Haven and the toy electric train which was your Christmas present may have been made in Bridgeport.

Helping and Being Helped.—We notice that most of the largest cities of southern New England are seaports. There is not enough waterpower available to run their big factories; steam must do this; and to furnish steam there must be coal. As New England has no coal, she must call on the coal mines of Pennsylvania. Because it is cheaper to bring the coal by water than by railroad, puffing tugs drag strings of loaded barges through Long Island Sound to Bridgeport and New Haven. Hartford is also a seaport, for vessels can reach that point by going forty miles up the Connecticut River. Up Narragansett Bay go the barges to Providence and Fall River, and along Buzzards Bay to New Bedford.

Because there are so many kinds of manufacturing open to the skilful New England workmen, almost every smaller city and town of southern New England makes a specialty of one or two particular lines, and thriving centres of manufacture have sprung up in most portions of these three states.

No other section of the same size in our country depends so much on manufacturing and so little on farming. A network of electric lines links together the many towns and villages, so that the tourist can travel comfortably and cheaply "over the hills and far away." Indeed, there are so many trolley lines, motor buses, and they go so directly over the hills, that they have greatly hurt the passenger business of the railroads.

If railroads and steamships stopped bringing in raw materials, the mills and factories of New England would have to shut down. If the mill-workers then became farmers, they would find that they could not raise enough food to sustain them, and most of the people of Connecticut, Rhode Island and Massachusetts would be compelled to move to other states. But there is no danger of that. Throughout the United States and throughout the world, all are helpers one of another, whether they know it or not. We are strong because we support each other. The people of New England serve other people, and other workers serve them. By trade and commerce all are united for mutual benefit, and "In union there is strength."

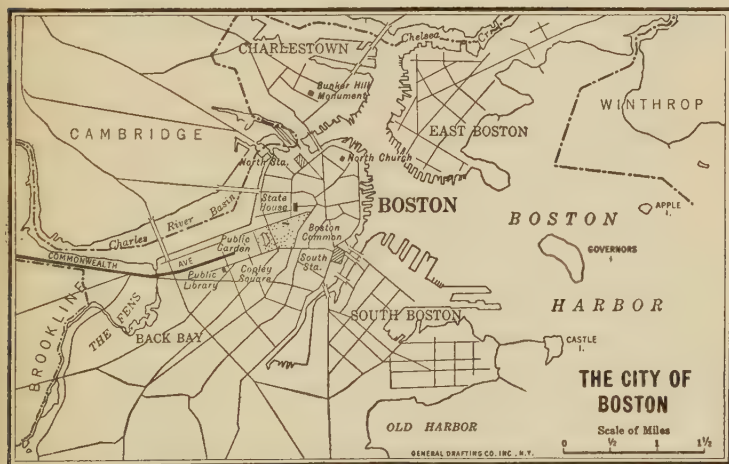
QUESTIONS AND SUGGESTIONS

1. On a large map of New England find various towns or cities whose names tell you that they are situated where there is water-power.
2. Find out how the old-fashioned housewife wove on a handloom. How do the looms of a modern factory differ from the old-time loom?
3. Find magazine advertisements of articles manufactured in southern New England. Which of these are rather small and light? Which are heavy and bulky? What is the raw material of each? Is that raw material produced in New England?
4. Make a sketch map of southern New England. Place on it the towns or cities which manufacture the articles mentioned in the previous question.

CHAPTER III

BOSTON AND ITS NEIGHBORHOOD

Queen of New England.—By far the largest city of New England, and its business centre, too, is Boston, which contains one out of every five persons in Massachusetts. Before we reach Boston, let's learn something about it. Boston began on a hilly peninsula which stretched out into Massa-



achusetts Bay. Commerce brought manufacturing; Boston spread out along the shore to one headland after another; she filled in marshes such as those of the Back Bay and has made them fashionable residence sections; thus she grew to be the seventh city in the United States.

Adjoining Boston are many beautiful towns, the largest of which are Cambridge and Somerville. Cambridge, on the

Charles River, is particularly famous for having our oldest university, Harvard, which is about three centuries in age, but goes on "from strength to strength." It now has more than a thousand professors and instructors. "I tell you what, that's a different teacher for every school day of a fellow's whole college life," Jack calculates. "Brother Dick goes to Yale University at New Haven," observes Ruth, "and he says that Yale and Harvard are friendly enemies, whatever that means." In Cambridge we also view the house which was Washington's headquarters in 1775 and where afterwards Longfellow made his home and wrote such famous poems as, "The Village Blacksmith" and "The Wreck of the Hesperus."

Because Massachusetts makes so much woolen cloth, Boston has become the chief market for raw wool in the United States. Our western sheep growers send the thick coats of their flocks to Boston, and many cargoes of wool from Argentina and Uruguay, from South Africa and Australia, come in yearly to fill up Boston's warehouses. From our southern states come still more shiploads of cotton to feed the factories. The "double arm" of Cape Cod has been cut through at the shoulder so that coasting ships can go through Long Island Sound, into Buzzards Bay, and then by short canal can reach the sheltered waters on the inside of the Cape. Thus they can save seventy miles of distance and avoid going around the stormy Cape, which, on the average, used to see the wreck of a ship a week.

Sight-seeing in Boston.—Let us take a little trip about Boston. In the heart of the city is Boston Common, shaded by old elm trees and famous in history. Through the trees we can see on Beacon Hill the highest spot in Boston, the golden dome of the State House, where the Governor of Massachusetts may be sitting at his desk this minute. From

the Public Garden on the west of the Common we go along Commonwealth Avenue, admiring its width, its central park strip, with trees and statues, and the handsome homes and



Charles Street, Boston, the historic Boston Common on the right, and the public garden on the left.

hotels which border the avenue. To the south as we pass along the avenue is the Public Library on Copley Square, where we go especially to admire the wall paintings representing the days of King Arthur.

Northward from the old part of Boston, in the district called Charlestown, beyond the Charles River, is the Bunker Hill Monument. As we look down from the top of that shaft of granite, we see below us the statue of Colonel Prescott, commander on that notable day, and we almost expect to hear him say, "Don't fire till you see the whites of their eyes." Perhaps we may go back to visit the old North Church, from whose steeple gleamed the lanterns which signaled Paul Revere to carry to Lexington the news that the British were coming. Boston is such historic ground that we could spend weeks in looking up famous places and learning our history lessons over again in a different way.

Shoes and Shoes.—North and south of Boston are towns in which the smell of leather is so strong that you may be sure shoes are made there. Brockton, twenty miles south from Boston, is the greatest shoe city of the world, and clustered about it are several other smaller towns which seem to think shoes all day and dream shoes at night. Lynn, on the north, comes next to Brockton in this line, and Salem, not far away, has forgotten her old-time commerce with the spicy Far East and has turned to shoes. Haverhill on the Merrimac, in the "Whittier country," also takes shoes for her specialty.

What can our friend, the superintendent of a Brockton shoe factory, tell us that is interesting? He says: "Nowadays few shoes are made by hand, but complicated machinery cuts out the various parts, fastens them together, and finishes them. The workmen, however, must be skilful and quick; many workmen handle each shoe before it is ready to wear. Did your shoes come from Massachusetts? Probably they did, for the Boston shoe district turns out one-half the shoes of this big country of ours. The cattle and sheep ranches and the slaughtering plants of our large cities furnish many hides and skins to be tanned into leather. The same ships

which bring wool to Boston from far-off lands may also bring in, from these same countries, crackling bundles of dried skins. Boston, therefore, is the leading leather market of our land as well as the leading wool market."

QUESTIONS AND SUGGESTIONS

1. What cities of the United States are larger than Boston?
2. Make a sketch of Cape Cod, showing Plymouth and Provincetown, and using dotted lines to prove how distance is saved by the Cape Cod Canal.
3. Make a list of other historical places which you would like to view when you visit Boston.
4. What New England cities get much wool through Boston?
5. "In Heave Short," by Charles Pendexter Durell, read of Sam Hotchkiss on Cape Cod and his experiences with the oyster business and sailing the *Cynthia B.*

CHAPTER IV

FOREST, LAKE, AND MOUNTAIN

Off to Maine.—"Aren't we going to see the other New England states?" inquires Fred, who is interested in all new places. Yes, we are ready to start now. (The three northern states of New England—Maine, New Hampshire, and Vermont—are quite different from their three southern neighbors. The northern states are much larger than the southern but contain far fewer people.) This is partly because their surface is not so easy to settle. Though the surface of southern New England is rough, the northern states have much higher hills and mountains. Many of these highlands are covered with dark evergreen forests, and among them sparkle thousands of ponds and lakes.

Let's go first to Maine, which could almost hold all the other New England states. We'll travel by way of her largest city. A steamboat from Boston brings us over-night into beautiful, island-dotted Casco Bay, on which lies Portland, the second seaport of New England.

Ruth would like to know if Maine has many other good harbors. A glance at the map gives Ruth her answer, for it shows that the shore-line winds in and out like the most crooked river you ever saw. In order to follow the shore of all those headlands and bays we would have to travel almost as far as from New York to San Francisco. Whittier wrote of "hundred-harbored Maine"; and yet while those words are true, most of Maine's harbors are not of great importance today.

Up to the Wilderness.—What did you say? You would like to go farther northward into the great forest region of

Maine to fish, to hunt, or better still, just to enjoy nature? All right, then, we'll go. We hire a strong, trustworthy guide, who furnishes canoes and tents, and cooks the filling meals which the hearty outdoors appetite demands. Moosehead Lake, the largest in New England, proves too civilized for our taste, so we get away from hotel, railroad and



Portland Head, guarding Casco Bay. Why are lighthouses usually painted white? How can a sailor tell one lighthouse from another at night?

steamboat, and wander east toward the granite cliffs of Mount Katahdin, in the centre of the state.

There we find wilderness enough to suit even Daniel Boone. The woods are full of deer. By day Jack surprises big, black bears at their lunch of blueberries, and by night we hear the great, clumsy moose splashing as he feeds on water-lily roots in the edge of some lake. If we had time, we could keep on through river and pond, with occasional carries or portages, until our light canoe had covered nearly

a thousand miles without once going over the same trail. No wonder that it is jokingly said, "A man in Maine cannot walk in his sleep without falling into the water."

The Age of Paper.—One day we come out of the woods upon a town whose neat houses cluster around great paper mills. We live now, so people say, in the age of steel, but it is equally true that we live in the age of paper and most of our paper is now made from wood. Once upon a time Maine was known as the "Pine-Tree State," because she had so many white pine trees in her forests. White pine is a wonderful wood, white, strong, yet so soft that it "cuts like cheese." The main parts of all New England houses at one time were built of white pine. Now most of those valuable pines have been cut down, and the next tree in importance and amount is the spruce. Can you tell a spruce tree by its coarse needles and the general "fingered" look of its branches?

Our printing presses call loudly for paper, and the Maine mills supply more than half the paper made in America. The spruce logs, cut into short sections, are torn apart by heavy machinery and dissolved by chemicals until the long fibers are separated from each other and form an oozy pulp. Great rolls of the dried pulp are shipped to paper-making establishments elsewhere. The coarsest and cheapest pulp is used for our daily newspapers—how easily that paper tears and turns yellow! The better pulp goes into magazines and books. (Holyoke, Massachusetts, on the Connecticut River, makes extra fine writing paper from cotton and linen rags, so does not need to go to the forest.)

Won't these hungry paper mills eat up all the woods before long, and be forced to move elsewhere? "To avoid this danger," says our guide, "the companies who own the mills are planting on the vast lands which they have bought,

new trees to replace the old. Thus, they hope to have a fresh crop of spruce forever ready to use." Much pulp also comes to us from Canada.

Down the Penobscot.--The stream which operates the paper mills leads us to the rapid Penobscot River. Along the river banks lie many logs, and we see the river men pushing off the logs from the rocks on which they run aground, so



Collecting maple sap in Vermont. What does the picture tell you about the time of year? Why does sap "run" so freely once a year?

that they may float down the current. Saw mills at various points on the river use many a fine tree trunk, but most of the logs are carried along until they reach a place where tide from the ocean twice a day stops the current of the river.

Here is the city of Bangor, with lumber mills and paper mills lining the Penobscot shore, sixty miles from the sea. What a great amount of wooden "Yankee notions" the Bangor mills produce! Shingles and sleds, toothpicks and toys, clothespins and crates, rakes and pails, bobbins and

spools for the New England cotton mills—all to make a living for the Bangor youngsters and their parents.

The White Mountains.—Say good-by to Maine for we must go back to Portland through New Hampshire until we come to the Merrimac River, our old friend, at its familiar task of turning the wheels of cotton mills. The Merrimac pathway leads us northward to a great group of mountains, higher than Katahdin, higher than any others in the east except those of North Carolina and Tennessee. These are the White Mountains, and they seem to beckon us to come to them. Let's hurry up and get there.

So beautiful is this highland region of the White Mountains that it has been called the "Switzerland of America." Here are about two hundred mountains, rising in wild beauty, and seeming to block off the northern part of New Hampshire. A great ravine, called Crawford's Notch, stretches through the heart of the highland.

Timothy Nash, a pioneer, while pursuing a moose, came upon this unknown valley. When he told the governor of his discovery, he was promised a grant of land if he would lead a horse through the Notch to show that the land could be settled. That job was not easy, but at last, by the help of a friend, Timothy hoisted the animal by ropes up over the giant rocks, into the Notch, and the two men received their land.

On the Summit.—Of course we must stand on the top of the highest mountain in the group; it is well named Mount Washington. We may go to the summit by automobile, or from the ordinary railroad we may take a queer "cog-railway." "This road looks as if it were going up the steep roof of a house," says Alice, shaking her head; "I don't like it much." It almost makes us tremble to think of a train

trying to go up such a slope. But look at the track. Here is a double rail in the centre, with iron crosspieces like a ladder laid on the ground. The small locomotive which waits for us has, beside its regular wheels, one with projections or cogs which fit into the crosspieces, so that the engine cannot slide back. Now don't you feel perfectly safe?

Our car now is in front of the engine, which therefore pushes us instead of pulling. Up, up we go, steadily and surely, but not much faster than a person can easily walk on level ground. We don't mind taking our time, however, for the view grows broader and broader as we rise. After a time we pass through a thick fog which leaves our faces, hands and clothes quite wet. The fog clears away, we come again into the sunshine and find that we have passed through a cloud. Now we feel that we are indeed high in the air.

"Look at the trees on the mountain side!" exclaims Ruth. As we go up, they grow smaller until they are nothing but evergreen bushes, bent and twisted by the howling winds and heavy snows of winter. You could make a chair of the top of a tree several hundred years old. Then these bush trees disappear entirely, and there is nothing to cover the bare rock, split into pieces by Jack Frost. We have passed the timber line.

Soon we stand upon Mount Washington's summit. The first white man who reached that point declared that he saw the ocean on one side and the Gulf of St. Lawrence on the other. Perhaps that was a tall story, for we cannot see the Gulf, but we can see the white sails of ships upon the sea, sixty miles or more away. All around us are other mountains, named for Presidents—Adams, Jefferson, Madison, Monroe, and Jackson—a fine group. This part of the highland is called the Presidential Range.

Vermont Sweetness.—Turning west from the White Mountains we cross the rapid Connecticut River and come into Vermont, whose name means “Green Mountain.” The Green Mountains do indeed run for more than one hundred and fifty miles through the whole length of the state, and along their backbone the “Long Trail” has been laid out for those who love to “hike” among beautiful views.



Supper on Rocky Pond, Maine. Do you think these people are on a long camping trip? Why? Is the big island rock a better place for eating supper than the shore? Why?

Long before we reach the Green Mountains, however, we see, stretching over the hills, many groves of sugar-maple trees, prized by the farmers. In the early days of spring when snow yet lies in patches on the ground, when the sun is warm at noon, but the night air is still sharp, the maple trees awake and begin to send up sweet sap to their branches and buds. Then the farmer goes to the “sugar bush” or grove, bores a little way into the tree and puts wooden spouts

into the holes. From each spout drips the sticky sap, which is caught in buckets.

After being collected, this pale, sweet juice is boiled until it thickens into sirup. If the sirup is boiled still more, it hardens, when it grows cool, into sugar. How good the maple taste is! Although a number of other northern states, such as New York and Pennsylvania, are tappers of the generous maple tree, Vermont stands first. So popular is maple sirup on hot brown griddle cakes that each year the Vermonters make more of the sap into sirup and less into sugar. The Greeks used to hang flowers on their specially loved trees. Doesn't the sugar-maple deserve a wreath?

Farewell to New England.—Like the sugar maple, the mountains hold within them treasures for man. Near the city of Rutland we come to a great hole in the ground and close by are great blocks of white marble, which have been sawed out of the rock. Perhaps one block will form part of a beautiful building, perhaps out of another will be shaped a fine monument. Vermont is the greatest marble state of the Union.

Now we take our leave of the New England States—the busy, “citified” three sisters of the south and the “countrified” three sisters of the north. Farming is dying out even in the northern states. Maine still boasts of her wonderful potatoes and her delicious sweet corn for canning; Massachusetts and Connecticut have large tobacco fields; there are profitable cranberry bogs at the base of Cape Cod; many dairy and truck farms supply the cities with good food, and many fine orchards cover the hill slopes. But the greatest wealth of southern New England will come from manufacturing, and the wealth of northern New England will depend mostly on a combination of manufacturing and of entertaining summer tourists.

QUESTIONS AND SUGGESTIONS

1. Why are most of Maine's harbors not very important to-day?
2. Read *King Spruce*, and *The Rider of the King Log*, by Holman Day. What ideas about lumbering does this give you?
3. Give as many reasons as you can why this is the Age of Paper.
4. What industries of northern New England are different from those of southern New England?
5. In *Camping In the Winter Woods*, by Elmer Russell Gregor, read how George and Ed visited the beavers and other wild-folk of Maine.
6. What rivers flow from the White Mountains? Sketch a map showing this.
7. Why should a winter without snow interfere with lumbering in Maine?

CHAPTER V

THE HUDSON TRAIL

Champlain and the Adirondacks.—If we turned northward on Lake Champlain, we should see its waters flowing into a river which would bring them to the St. Lawrence, but we shall not take that road. Our way lies southward to New York City. As we look at the beautiful lake, of what



Lake Placid and Mount Whiteface, Adirondacks.

man does it remind us? "Why, of course," cries Fred, "I would think of its discoverer, Samuel de Champlain. I remember what he did. Along the lake he went with a war party of Canadian Indians to attack the Iroquois. He shot down their chiefs and won the battle, but those fierce warriors forever after hated the French and helped the English." The lake is long and narrow, only ten miles wide at this point. On the New York side rise steep hills which soon swell into the Adirondack Mountains.

The Adirondacks form a great circle of mountains covering the northern part of New York, as thickly dotted with lakes as Maine. Lake Placid is perhaps the best known of the lakes, for even in winter it offers great sport, but the canoeist knows and loves those long lake chains of which the most famous is the Fulton Chain. New York State holds a vast extent of land as the Adirondack Park, a wonderful playground for its people, where campers may enjoy glorious outdoor days. Through the great Adirondack Park roam deer and bear; and the beaver are growing so numerous that the water backed up by the dams which they are forever building overflows roads and kills whole groves of trees.

From Ticonderoga to the Hudson.—A steamboat bears us southward up the lake. Oh, see that fort on the New York shore! That is Ticonderoga, “old Ty,” once the strongest British castle in America; but for one hundred and thirty years it lay in decay. Finally a patriotic architect restored the main part of Ticonderoga and now it looks as it did in the days of its power. Ticonderoga, in the Iroquois tongue, meant “Sounding Waters,” for nearby is a waterfall by which the waters of the river leading from Lake George plunge down to the level of Lake Champlain.

Here we leave our steamboat and travel over the four miles of road to Lake George, along whose length Cooper's hero, Hawkeye, the “Long Rifle,” scouted and hunted. Lake George is only about one-quarter as long as Champlain, but it is one of the famous sights of New York. Look at the mountains coming right down into the water, and the multitude of islands which dot the narrow lake. Both islands and shores are dotted with hotels, cottages and camps. With regret we step from the steamboat at the head of the lake, and go on south to find our friend the Hudson rushing down

from its Adirondack springs. Not many miles farther on we come to the mouth of the Mohawk River, the chief branch of the Hudson, as it flows in from the west.

Troy and Albany.—Just below the mouth of the Mohawk at Troy we see the mouth of the big Barge Canal which we shall later follow. Troy is known as the “Collar City,” for most American men wear a Troy collar. Troy also makes many shirts for men and manufactures the machinery for the steam laundries which do up the shirts and the collars.

At Troy large boats can navigate the river, for tide flows up this far from the ocean. Six miles below Troy is Albany, on a height crowned by the immense capitol building, where the state laws are made, where various offices of the state government are located, and where we can read in the state library.

The Albany Crossroads.—Albany carries our thoughts back to a time before the landing of the Pilgrims, when the Dutch built a trading post at the spot, later setting up Fort Orange. It was a good choice for a settlement; the map will tell you that Albany is now at the crossing of four traffic roads. One road leads north along the Champlain Valley to Canada, another west along the Mohawk Valley, a third south along the Hudson Valley, and a fourth—well, let us see.

East of Albany and the Hudson Valley lie the fertile lands of the Connecticut Valley, but between these two regions rise the Berkshire Hills, making a wall of rock, hard to pass. A little river which flows into the Hudson comes from one side of this wall, and a little river which flows into the Connecticut comes from the opposite side; but a mountain separates these river valleys. When an engineer surveyed this broken travel way, he said, “It seems as if the finger of Providence had pointed out this route from the east to the west;” but another man replied, “It’s too bad,

then, that the finger of Providence was not thrust through the mountain."

At last another engineer did put a hole through the mountain, but it took twenty-five years to finish the work. Though this Hoosac Tunnel was completed as long ago as the year



Looking north up the Hudson from West Point. You can see the end of the Highlands. The cadets get artillery practice with the guns in the foreground.

1875, it is still the longest tunnel in America, nearly five miles in extent. Now Boston and Albany are united by railroad, and the crossroads of Albany are complete.

A River Voyage.—At Albany we take a fine steamboat down the river. After a time another group of mountains may be seen in the west. These are the Catskills, where Rip Van Winkle was supposed to have slept his magic sleep of twenty years, and where John Burroughs the naturalist lived and wrote at "Woodchuck Lodge." In the Catskills,

New York City, reaching out for more water to supply her fast-growing people, made an artificial lake, the Ashokan Reservoir, twenty miles long; yet even that did not provide sufficiently for her needs, and she has tapped the Mohawk waters farther north.

The Catskills lie a little west of the Hudson; but as we continue our voyage we see mountains stretching right across our river's course. "These," says a trim, athletic fellow, "are the Highlands, where the Hudson cuts through the Appalachian ranges. Among these heights the river winds and twists. Some of the Highland summits have names that strike my fancy—Storm King, Crows Nest, Anthony's Nose and Break-neck Mountain. There, now, in the midst of these summits is West Point, the great academy where Uncle Sam teaches young men to be officers of our army. I'm one of these cadets, and during the summer we camp out and take our training in the field. General Robert E. Lee was once superintendent of West Point, where he had been a cadet."

As we leave the Highlands the railroads which follow the Hudson, one on each bank, are more plainly seen. The West Shore Railroad lives up to its name, and on the eastern bank are the tracks of the New York Central. Almost all river valleys make useful paths for railroads, and in our travels we shall notice many such.

Now there comes into view a high wall of rock on the western bank. It is lava poured out red hot many ages ago. In cooling, the rock sometimes takes the form of rough pillars, and here and there the pillars look like huge beams set upright to form a stockade or palisade like that which protected Daniel Boone's Kentucky fort. "The Palisades" indeed is the name of this rock formation, which for an hour or more we look at with pleasure. We pass Yonkers, with its carpet factories and sugar refineries—then we once more reach the giant city of New York and our voyage ends.

QUESTIONS AND SUGGESTIONS

1. What happened at Ticonderoga?
2. Read Cooper's *Last of the Mohicans* and find out why Hawkeye hid his friends in the island cave at Glens Falls on the Hudson and what happened to them.
3. What great help of modern times was lacking for the engineer and laborers of the Hoosac Tunnel?
4. Read in *Williams of West Point*, by Hugh S. Johnson, how the plebes of the Military Academy furnished "Sammy Fights" and "Rat Funerals" to amuse their superiors.
5. What school for the navy is like West Point for the army?
6. Describe from your history the Indian fight in which Champlain won the victory.

CHAPTER VI

THE MOHAWK PATH

The Mohawk River.—While the white men explored New York they found, living in the heart of that state, five tribes of Indians called the Iroquois, united in a brotherhood which they named "The Long House." In the eastern part of the Iroquois territory lived the Mohawks. The stream which flowed through the Mohawk country and fell into the Hudson was, therefore, called the river of the Mohawks or the Mohawk River.

As the whites wished to push toward the west, they found that the Mohawk Valley offered an easy road, a broad lowland between the Adirondacks on one side and the Catskills on the other. Boats could not pass directly from the Hudson into the Mohawk, because near the Mohawk mouth there was a high waterfall; but the Indians made a long "portage" or carry from the Hudson across the sandy plain back of the spot where Albany stands today. How would you like to carry your canoe sixteen miles? "I'm glad I don't have to," says Jack. "It wouldn't be any fun."

The "Gateway."—The Indian portage reached the Mohawk at a place of rich meadows, and just west from this stood high hills between which rushed the river. This place the Iroquois called "Schonowe," the gateway. That gateway made it possible for a traveler from New York City to reach the foot of the Rocky Mountains, two thousand miles away, without climbing any heights.

Now, just below the "gateway," on the "great flats," which the Dutch were pleased to see, spreads out the city of

Schenectady (Ske-neċ-ta-dy), which is larger than Troy. Schenectady has as its main business the making of locomotives and of electrical machinery.

In 1790, John Post with his wife and family set out in a long, light "bateau" to ascend the Mohawk. After a toilsome voyage of nine days he reached a fort around which a few houses had been built, and there he set up a store. The fort was built where the Mohawk grew shallow enough so that horses could wade across. Now the settlement at Fort Schuyler has grown into the important city of Utica, which is the centre of a rich farming country, has large cotton and woolen mills, and makes much clothing. Instead of taking nine days to go from Schenectady to Utica, express trains of the New York Central Railroad pass over the distance in a little more than an hour and a half.

Rome and Syracuse.—A little west of Utica we come to Rome—no, Ruth, not the famous city of Italy. Here, if we wish to travel farther west, we must leave our friend the Mohawk. Forty years later De Witt Clinton's workmen began at this spot to dig the great Erie Canal, which united the waters of the Great Lakes with those of the Hudson.

The old canal boats in time proved to be so small and so slow that the railroads carried almost all the freight; so the State of New York built a new Erie Canal along the line which De Witt Clinton laid out. In places the old Erie Canal has been swallowed up by the new one, in places it has been left to one side. Now steel barges holding ten times as much freight as the old boats, and towed by a tug, operate on the new canal, which is called the New York State Barge Canal.

A branch of the Barge Canal leads southward to Syracuse, the largest city of central New York. Syracuse, now a city of many manufactures, had its beginning in salt. French missionaries were taken to the salt springs here by the Indians

when the country was a wilderness, and later the state of New York took charge of the pumping of salt water from the wells which had been dug. After the Civil War beds of rock salt were found farther west in New York and then in Michigan, and the Syracuse wells are no longer used to make



In the heart of Syracuse, through which runs the Barge Canal. It was the old Erie Canal that made Syracuse grow into a large city.

salt. A great chemical works at Solvay, near Syracuse, however, draws brine from these wells and makes various chemicals from it.

Let's jump on board a big barge that is going back to the main canal, and it will take us near Rochester, third city of the state in size. Many years ago Colonel Rochester left his Maryland home to settle in the wilderness of New York,

on the bank of the Genesee River, and his friends wept to see him go. Soon, however, the rich Genesee lands brought forth so much wheat that his frontier settlement prospered and grew.

For a long time Rochester supported herself mainly by shipping wheat and making flour. The Genesee tumbles over high falls in the centre of the city, so furnishing much power, and then rushes madly down toward Lake Ontario for seven miles, thus giving more power. Many flour mills still are busy in Rochester, but the city is more famous now for kodaks and films, opera glasses, field glasses, and spectacles. "I think my camera came from Rochester," observes Fred, much interested.

Busy Buffalo.—Follow the Barge Canal for seventy miles more, it leads us down through lock after lock until we see the blue waters of Lake Erie sparkling in the sun. At the end of the Barge Canal we find the big city of Buffalo, second city in New York State. Once upon a time great herds of shaggy buffalo came to a salt lick along a little creek that flowed into the lake, so that the stream was called Buffalo Creek. Then, when a tiny village grew up at the mouth of that stream, the village received the name of Buffalo. When the war of 1812 ended, Buffalo was a miserable place that had been burned by the British during the war and was just struggling back to life; but ten years later the Erie Canal put red blood into Buffalo's veins, and now it is busy indeed by both land and water.

At the point where Lake Erie ends and its waters pass out by the Niagara River stands the city. It is a great junction station of traffic, a place where great quantities of material have to be handled. President McKinley called Buffalo "the doorway of the inland seas," meaning the Great Lakes. Down the lakes come thousands upon thousands of steamers carrying to Buffalo wheat, flour, iron, and lumber. At

Buffalo they are unloaded. Part of their cargoes are put on barges to go to various places along the canal, but much more is taken away by the score of railroads which spread out like a fan from this busy community.

Just the handling of the eastward traffic employs many people; but we must not forget that the lake steamers must carry back a cargo. What is needed by those northern states which have long, cold winters? Coal is the answer—as much coal as the steamers can carry; so at Buffalo docks we can always see huge piles of “black diamonds” waiting to be shipped west. More handling by Buffalo comes from this trade in coal.

We have seen in New England how profitable it is to manufacture goods out of raw material. Buffalo has also taken up this way of making a living. Instead of sending along eastward all the wheat which comes into her doorway, Buffalo sets up mills and makes a great deal of it into fine flour. She takes some of the iron ore as it arrives and turns it into iron and steel, then out of the iron and steel she makes nails, stoves, and farming machines. She takes some of the lumber from the steamers and produces furniture. As the steamers carry coal back up the lakes they may take along stoves in which to burn it, farm machines for the wheat raisers, and furniture for the homes of farmers and miners.

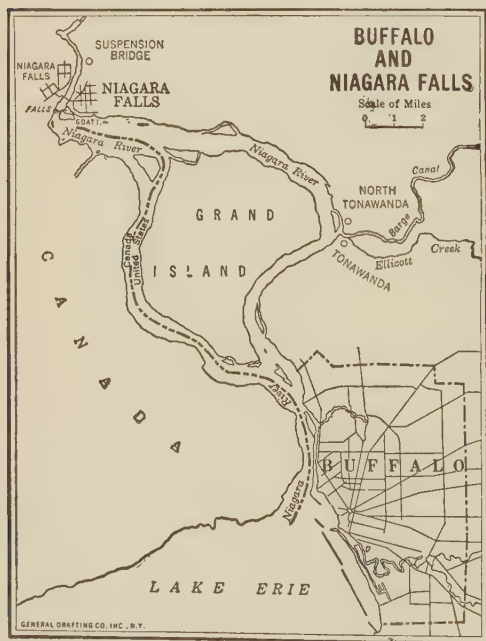
Thus, Buffalo profits like the famous hotel keeper who said, “I catch ’em comin’ and goin’.” By passing goods on to the other fellow and by making goods which she can pass on, Buffalo thrives and grows. We think she is very lucky in being only twenty miles from Niagara Falls, for the immense power of the water there produces electricity which is sent to run the Buffalo street cars and turn the wheels in many clean and bright Buffalo factories.

Jack Frost Outwitted.—“The people of Buffalo ought to be fruit lovers,” says Alice, “for as we went through that

part of New York I saw wonderful apple orchards." Though many apples are grown elsewhere in the state, particularly along the Hudson, these western orchards south of Lake Ontario are the ones which make New York first in the Union for apples. "But why is this such a good place for apple

growing?" Fred wants to know.

The orchardist however is never anxious to see the buds on his trees swelling and opening early in the year. He knows that the first warm days of spring will not last and that Jack Frost will come back some night to bite and kill every bud that has opened. Therefore, every fruit man would be glad if his trees would hold back from



budding until Jack has been driven away altogether. Even the orange trees of Florida, far south, have suffered greatly by freezing.

Near the Great Lakes, however, fruit trees are quite safe from having their buds killed. The water, you know, takes in heat much more slowly than does the land. Even in summer the Great Lakes are not very warm; so in spring the winds blowing across Ontario keep the air of the orchards

chilly. When the buds at last peep out, Jack Frost has gone far away. On the other hand, in fall, when the land begins to get cold at night, the lake water, which gives out heat slowly but surely, just as it took it in, warms up the evening air, and keeps Jack from returning so soon. Peaches and pears in great plenty are raised along with the apples by these well protected fruit growers of western New York.

QUESTIONS AND SUGGESTIONS

1. Read the story of the wonderful celebration when Clinton's Erie Canal was finished, and tell your class about it.
2. Draw a sketch of the course of the Barge Canal.
3. How does the industry of Buffalo resemble that of Massachusetts?
4. When are the fruit trees of your neighborhood safe from frost in the spring? How early does killing frost usually come in the fall?
5. What Indian names can you find on the map of New York?

CHAPTER VII

NIAGARA AND THE ERIE PLAIN

Thundering Waters.—We have started out with Uncle James for a special trip to the greatest falls in America—wonderful Niagara, the “thundering water” of the Iroquois. At Buffalo begins the Niagara River, which is more a channel than a river, for it is born full-grown. Through this spout pour the floods of four enormous lakes, which this channel conducts into Lake Ontario.

Between Lake Ontario and Lake Erie is a flat surface or plateau, and for about twenty miles the river flows along on this plateau, dividing to enclose a large island, which is fitly called Grand. Then, just before it comes to small Goat Island, the river bed takes a slant and the calm current breaks into rapids, then leaps into a deep gorge which the falls themselves have cut.

Goat Island divides the water of the river into two falls, the American and the Canadian. Only one-twentieth of the flow passes over the very shallow American Falls, while the Canadian or Horseshoe Falls are three times as wide as the American and the water in the centre is probably twenty feet deep. What a thundering roar comes up from the bottom!

Uncle James takes us on board a small steamer, the “Maid of the Mist,” to see the cataract from below. Up to the very falls the “Maid” seems determined to go. The flying spray wets us from top to toe, but the view is grand enough to repay any drenching we may suffer.

The Gorge.—The gorge which the falls have cut, working back from the old rocky shore of Lake Ontario, is seven

miles long. Through the gorge the current races at a speed of nearly thirty miles an hour, flung back from the rocky walls in tossing waves. Half-way, this canyon changes its course, making a sharp turn by which the waves are thrown against the rock. They have scooped out a hollow where the foaming water eddies. This is the famous whirlpool



View of Niagara Falls. Goat Island is in the middle. Notice the irregular line of the falls.

where objects carried down the rapids above may circle for days and days before they escape. Coming out of the gorge, the river becomes peaceful again for several miles before it reaches its resting place in Lake Ontario.

Viewing the falls has been made easy. On one side New York State has created a park, on the Canadian side Queen Victoria Park extends along the edge. Just below the falls is a bridge across the gorge, and two other bridges

cross from New York to Canada near the whirlpool. A trolley line runs through the gorge and another electric road extends along the top of the cliffs on each side. Thus, from every point of view we are able to inspect at our leisure this marvelous sight.

Power of the Falls.—"Think of the power which lies within those thundering falls!" says Uncle James. "Nearly half a million tons of water are falling about one hundred and sixty feet each minute. If the full force of Niagara were to be harnessed it would supply one tenth of the power needed by our whole country. As it is, considerable use of the power has been made.

"Canals draw off water from above the falls; it rushes through tunnels and pushes against great turbine wheels with many blades, turning them at high speed. An upright shaft connects each turbine with dynamos in the power house far above. Thus plants have sprung up for making calcium carbide (which generates acetylene gas), for making graphite which lubricates machinery and forms the carbons of arc lights, for manufacturing the new metal aluminum, and even for baking wheat biscuits in electric ovens. The town of Niagara Falls, situated on the American side of the cataract, has grown, on account of the water power, into a good sized manufacturing community. Another town named Niagara Falls, but only one-third the size of its United States neighbor, has sprung up on the Canadian side, and uses power for the same purposes."

The Welland Canal. White Coal.—"I think that Niagara Falls would stop eastward-bound vessels from going any farther, for Buffalo is the natural stopping place for United States cargoes," says Alice.

"Well, man has found ways of outwitting nature," answers Uncle James. "The Canadians cut through their land the Welland Canal, between twenty-five and thirty

miles long. It was before the Erie Canal was finished, and like the Erie Canal it had to be 'made over' to accommodate the bigger vessels of today. Now an ocean-going steamship can comfortably pass between Lake Ontario and Lake Erie. The new Barge Canal and the new Welland Canal are both fine works of engineering."

As coal, petroleum, and natural gas grow more scarce and more expensive, we shall turn our country's water power such as that which Niagara creates, to more advantage. If we preserve the forests on our mountain slopes we shall also preserve the flow of water in our rivers. As the years go by, this water power or "white coal" of ours will be harnessed to labor for us. Some of our steep rivers will be made to flow in steps, from one dam to another.

At each dam will stand a power house, and these "generating stations" will be linked together until such a great force of electricity will be the result, that it can be used four or five hundred miles away from its source. Cleaner, better cities, and easier work for man will come from using "white coal."

The Grape Belt.—Let us go southwest from Buffalo, still using the New York Central Railroad, along the flat shore of Lake Erie. "What are these vines covering stout framework in the fields with their broad leaves? Why, there are rows and rows and they seem almost endless," says Jack. They are grape vines, and this is one of the finest grape-growing portions of America. This fall the vines will be loaded with big purple Concord grapes. In September and October the boys and girls of New York will be enjoying these delicious bunches.

This grape belt extends along Lake Erie through Pennsylvania into Ohio, but probably it is most important near Chautauqua Lake, from which the Chautauqua entertainments get their name. There are large factories which bottle

grape juice so that it will keep throughout the year. In the midst of orchards and vineyards lies the city of Erie, which is the only lake port that Pennsylvania owns. Pennsylvania bought a good-sized piece of land especially in order to have a harbor on the lake. A long sandbar incloses here a fine safe harbor, and Erie has considerable commerce and manufacturing of the same sort as Buffalo. Not being on a natural road to the east, however, Erie has never grown so fast as her New York sister, and is now only one-fifth as large. Now let us take a basket of grapes and a pocketful of apples to eat on our next journey, which will show us a different kind of industry.

QUESTIONS AND SUGGESTIONS

1. Write a letter to your cousin in Boston describing a trip on the "Maid of the Mist."
2. Where at Niagara is the "Cave of the Winds?" Would you like to visit it? Why?
3. Read in *The Pathfinder*, by Cooper, the Pathfinder's joking conversation with Cap, the sailor, about Niagara Falls.
4. Where in your neighborhood could "white coal" be produced and used?
5. From what points of observation can you get a good idea of the Falls?

CHAPTER VIII

PENNSYLVANIA'S WELLS

Into the Allegheny Plateau.—We now leave the Lake Plain, so flat and rich even though narrow, and we travel southeast. As we proceed, the country grows more and more hilly, for we have reached the Allegheny Plateau, which covers the western and northern part of Pennsylvania, about one-third of the state.

“How can the word ‘plateau,’ which means ‘flat place,’ be given to such a rough region?” asks Ruth. That does seem queer, but when we climb to the top of the hills, we find flat land, and we see that if the many valleys of the Plateau were to be filled up, the whole surface would be almost flat. Both “plateau” and “plain” give us the idea of flatness, but a plateau is high, while a plain is low. A plateau, however, is often so cut up by the work of streams that it looks like a mass of hills or mountains.

After a time we come to Oil Creek. The stream is well named, for here Edwin Drake dug a well which really started the oil business in this country. For many years before that, the Seneca Indians skimmed off the oil which floated on certain New York springs and streams near the Pennsylvania boundary and used the oil for medicine. Then white men began to sell this “Seneca Oil” or “Genesee Oil” to the settlers as liniment for pains and aches.

The Oil Rush.—As this greasy fluid came from the ground, it was called “petroleum” or “rock oil.” After a time, from some wells that were dug for salt, petroleum flowed freely, and it was found that the oil burned well. People began to think, “Why can’t we use this rock oil in

our lamps instead of whale oil?" At last a company was formed to dig some wells for oil along Oil Creek.

Though considerable oil appeared, the company made no profit; but five years later in 1859, Edwin Drake dug into some of this very land. His well was only seventy feet deep, yet it produced a good stream of the desired oil. By this time people knew quite well that petroleum was valuable. There began a rush to the Pennsylvania oil fields that was like the rush to the California gold fields only ten years before. The rough, wild lands of the plateau brought enormous prices.

The Oil Wells.—"How were the oil wells sunk?" is Fred's question to one of the oil men. "They were drilled," replies his new friend. "A boring was made in the ground and pieces of pipe called 'casing' were driven into this hole, one on top of another, for hundreds or thousands of feet. Sometimes when the drillers struck oil it came spouting up with a roar, and such a well was called a 'gusher,' but usually the oil had to be pumped up as water does. To support the drilling and pumping machinery there had to be a tall framework called a 'derrick,' which looked like the frame of a windmill, only much stouter. A forest of derricks soon showed where the oil fields lay.

"Great fortunes were made by oil and many were also spent, for business was brisk and people took chances. Towns grew up almost over night. For twenty-five years after the end of the Civil War Pennsylvania wells poured out an ever increasing stream of petroleum. Now many of her wells have gone dry and much of the glory of her oil fields has departed. Still she produces millions of barrels yearly, but when we think of oil today in America we think first of other states, such as California and Oklahoma."

Explorers for oil soon discovered it in states bordering on Pennsylvania; in the end they traced a great oil field

which they called the Appalachian field, and which stretched from New York State to Tennessee. In this field Ohio and West Virginia are today as important as Pennsylvania.

A Marvelous Thing.—When we follow Oil Creek to its mouth at the Allegheny River, we reach Oil City, the centre of Pennsylvania petroleum fields. Oil City supplies every-

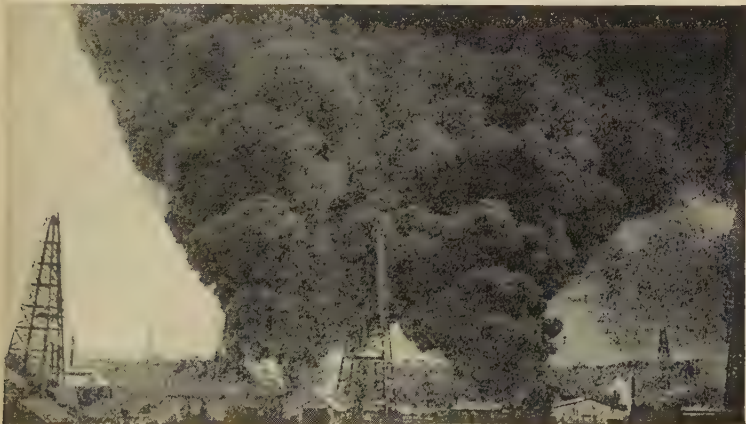


Photo by Chamberlain.

Petroleum well on fire. Much valuable oil is lost in this way. The derricks which you see are used in drilling the wells, and are left in place afterward, although they are then of little use.

thing that oil well workers need, and in addition has refineries for the oil. By skilfully heating the "crude" oil from the wells, catching the gases that come from it, and then cooling these gases, the refiners get many valuable products.

For a long time, kerosene for lighting was the greatest product of refiners, as electricity did not then brighten our homes; but now it is gasoline which is most desired. Our many millions of motor cars and trucks would stop if the refineries ceased working. Beside gasoline and kerosene, many other wonderful things come from oil. Benzine cleans our clothes, paraffine covers jars and makes candles, and

after gasoline, kerosene, benzine and paraffine are taken away there remains a thick, dark stuff called coal-tar, which is a perfect treasure house. Clever chemists can make from it hundreds of wonderful colors, flavors and perfumes. What a marvelous thing is oil!

Underground Streams.—The greatest oil refineries, however, are not in the oil fields. They are in or near the largest cities, because there is the greatest call for the things which they produce. Pennsylvania oil goes to refineries in Cleveland, in Bayonne, in New York, and in Philadelphia and its neighborhood. How does it get there?

At first the oil was carried in big tank cars; but now large pipes stretch underground from the oil fields to the refineries. If laid out straight the oil pipes of the United States would reach back and forth many times across our continent from New York to San Francisco. Along the pipe lines there is a pumping station every thirty or forty miles, so the oil is kept streaming along from the well toward the refinery and toward you. It is strange to think of these currents of oil passing beneath our very feet. We may also liken this flow to that of the blood in our body, for indeed, oil is the life-blood of the world today.

QUESTIONS AND SUGGESTIONS

1. "Brother Squaretoes" is one of the stories in *Rewards and Fairies*, by Rudyard Kipling. Read in this how Toby Hirt traveled through the wilderness to buy oil from the Seneca Indians.
2. When a new discovery of oil is made in any part of the United States, what happens?
3. What products used in your home come from petroleum?
4. Why is oil called the life-blood of the world?
5. In your text-book find an oil map of our country. Note and tell what states are in the Appalachian oil-field.

CHAPTER IX

THE CITY OF IRON AND STEEL

Washington's Choice.—The greasy waters of Oil Creek flow into the Allegheny River, so let us follow the Allegheny south through the deep valley which it has cut in the Plateau. After many miles we reach a spot where a similar river, the Monongahela, comes northward and joins the Allegheny to make the great Ohio. At the junction is a flat, triangular piece of ground; long ago, when this was a lonely spot in a great forest, young George Washington cast his eye upon it. "This would be a fine place for a fort," said he.

The fort was built, but the French soon captured it and then defeated and killed foolish General Braddock who came to make the French surrender. Three years after Braddock's defeat, however, it became English once more and received the English name of Pittsburgh, the town of great William Pitt, director of England's forces. Today Pittsburgh has become a great city, larger than Buffalo, but we are glad that a part of the old English fort still stands, near the junction of the rivers, to remind us of her history.

Pittsburgh's Business.—The situation of Pittsburgh is such that it could not fail to become one of the main workshops of the United States. In the Plateau, railroads must follow the deep river valleys, and therefore must centre at Pittsburgh. From that point the three rivers can all be navigated by small steamboats, and this is a great advantage to the city. Nearby also are fields of iron ore, and an immense coal field surrounds Pittsburgh. Few cities have so many advantages for manufacturing.

At first Pittsburgh's main business was boat building for the emigrants who went down the Ohio to settle the West. The first steamboat which ever traveled on the Mississippi was built at Pittsburgh. Then an iron-mill was set up, and after a time Pittsburgh became our greatest iron-making city. After the Civil War Andrew Carnegie and other Pittsburgh iron men began manufacturing steel in a very cheap,



Looking up the Ohio River to the tip of Pittsburgh, between the Monongahela on the right and the Allegheny on the left. Notice the stern-wheel, light-draft steamer pushing a barge.

quick way. When our land entered the "Age of Steel," Pittsburgh was busier than ever.

Now along the banks of the rivers stand many iron furnaces and steel mills. By day they pour out from their chimneys such black clouds that Pittsburgh is often called "The Smoky City." By night, bursts of flame light up the darkness and show that work is being carried on. Pittsburgh no longer depends on Pennsylvania iron, for it has been found that iron ore can be brought cheaply along

the lakes from Minnesota. Hundreds of steamers carry the ore to Erie or some other lake port, and thousands of cars take it southward to the greedy blast furnaces of Pittsburgh.

Making Steel.—A blast furnace has a tall stack, twice as high as an ordinary house. Into this stack is poured a load of coke, then a load of limestone, then a load of ore, in turn until the stack is full. Workmen set the lowest layer of coke on fire, and to make the fire very hot, blasts of hot air are forced in at the bottom of the stack. Gradually the ore melts, and the limestone makes it melt more easily.

“What happens then?” asks Ruth, and the broad-shouldered workman who is showing us around replies, “When the ore is melted, the iron is drawn off through holes at the foot of the furnace, then the slag or refuse rock is dumped into a chamber below. Formerly the iron was run into molds of sand and cooled into chunks or ‘pigs,’ and then was melted again. Now at many plants the hot ‘pig-iron,’ as it comes from the furnace, is carried away on a little railroad in bucket-shaped cars called ladles. Before it can lose its heat the iron reaches another furnace and is made into steel.”

Some iron is run into molds that form it into useful shapes; that is cast-iron. The frame of your school desk is probably made of cast-iron, which is hard but breaks easily. If cast-iron is heated for a long while in a furnace with flames playing over it, while a brawny “puddler” with his long rake rolls it around, it becomes very tough but rather soft. It would not break under a great strain, but would bend. This is called wrought iron.

Heavy Work.—However, for our bridges, tall buildings, and railroad tracks, we need a material which will neither easily break nor bend out of shape, and so we make these of steel. Steel will not break easily, and while it bends, it is very elastic. It is just the thing we need. Many different

kinds of steel are made by mixing various metals with the iron, and the world keeps calling for more steel of every kind.

Pittsburgh turns out more steel rails and steel cars, more steel beams and steel plates than any other city in the world. It is hot, heavy work in the iron and steel mills, and many strong men from foreign lands labor there. Pittsburgh makes iron and copper bars into wire. Her barbed wire helped to fortify the trenches in the World War, and many thousands of miles of "insulated" wire, wrapped about with silk or cotton to keep the electricity from escaping, come from her factories yearly. There is also an enormous amount of electrical machinery made in the city. Pittsburgh leads the world in making glass, because she has a good supply of natural gas, which gives the best heat for such purposes.

An Inland Port.—Pittsburgh is not only a great manufacturing city, it is also a great port. As it stands at the head of the Ohio River, it is the eastern gateway to the Mississippi Valley both by water and by land. Henry Clay liked to tell a story of the captain who took his ship a thousand miles along the Ohio, another thousand down the Mississippi, sailed through the Gulf of Mexico and the Atlantic Ocean, and at last anchored in an Italian seaport.

"Where do you come from?" asked the Italian officer in charge of the port. "From Pittsburgh," answered the captain. "There is no such port; your papers are false," cried the officer; and the captain had a hard time to convince the Italian that there was such a port in the heart of America.

The main article which goes by water from this "unknown" port is coal. Near Pittsburgh are hundreds of coal mines, and a constant stream of coal comes down the Monongahela River. Our government has made dam after dam in this stream, so that the water is backed up into still pools far into West Virginia. Five miles below Pittsburgh is

another dam, which provides a fine stretch of harbor where the coal barges lie, waiting for high water.

When rain comes and swells the Ohio, the locks of the dam open, and steamboats push down the river a great fleet of these coal barges, tied closely together and covering a large space. It would take many trains to carry as much



A coal mine town at Fireco, West Virginia.

coal as a couple of small steamers can thus take down stream to various cities, ending with New Orleans. Millions of tons of coal go southward by water from Pittsburgh each year.

Coke-making.—Not far away from the city are long rows of coke ovens which at night send forth a glare like the blast furnaces. You remember that coke is used in the blast furnaces, and it is used for two reasons. First, it makes even a hotter fire than coal, and second, it is harder and keeps up

the great weight which lies upon it in the stack of the furnace.

Coke is made by heating coal in ovens which have very little draft. The coal does not burn, but the gas is driven off, and the dark hard coke is left. In the old "beehive" ovens this valuable gas was all wasted and it escaped to kill trees and grass in the neighborhood, but in the newest kind of ovens this is kept and used. Many materials are going to waste in this country, but wise men are trying to discover ways and means of using everything to the limit. The people of Europe can give us lessons on preventing waste, for theirs is an old, thickly settled continent, and they have been forced to practice economy.

QUESTIONS AND SUGGESTIONS

1. What workshop-cities, other than Pittsburgh, are on navigable rivers?
2. How is steel used in your home?
3. How can foreign laborers become true American citizens?
4. In *Steel Preferred*, by Herschel Hall, read about the rough and hard experiences of Wally Gay, the boy who grew up in the steel-mills.
5. What gateway cities have you visited thus far in our trip?

CHAPTER X

BLACK DIAMONDS

Soft Coal.—The Appalachian coal field, in which Pittsburgh lies, is the largest and most important in the United States, and stretches through West Virginia and Kentucky as far south as Alabama. "Seems to me," says Alice, "that the Appalachian coal field and the Appalachian oil field must cover about the same space. I must look that up on the map." This field, which covers almost half of Pennsylvania, is soft or bituminous coal of very good quality for burning. The layers of rock in the Plateau lie nearly level, so that the streaks of coal can be seen cropping out along the rivers. It is easy to drive tunnels or "drifts" right into these layers.

When coal is brought out from the drifts the laborers slide it right down into barges on the water or cars on the land. This easy mining can be best seen along the Monongahela. Pennsylvania and West Virginia coal, as we have seen, goes to Buffalo, Erie, and other Lake ports to supply our northern states and Canada. Another part of the coal, you remember, is taken by the barge fleets down the Mississippi. Still another portion is burned in the coal fields themselves to heat furnaces and run machinery.

Let's leave Pittsburgh and go eastward on the Pennsylvania Railroad eighty miles, past more iron furnaces, coal mines and coke ovens, until we reach Johnstown, which was once wiped out by a tremendous flood that came from the breaking of a high dam and swept down the narrow valley. More than two thousand people lost their lives that fatal day, but the citizens of Johnstown stoutly set to work and

built the town once more. Now it is again a thriving place, busy with coal mines and great steel works.

Not far east of Johnstown the Plateau comes to an end. Below us is a slope, the edge of the Plateau, a thousand feet high. This slope is called the Allegheny Front, and many people think it is a real mountain. Far down, at the foot of the Allegheny Front, lies Altoona, which was born because the Pennsylvania Railroad put its immense repair shops there. The climb up the Front, even though it is made in a great curve, the famous Horseshoe Bend, is so steep that no shaky locomotives can do it, and it is dangerous for any train without good brakes to come down. You see that Altoona is an excellent place for repair shops, and those works are now the largest in the world.

Along Two Valleys.—The train moves on, down the valley of the Juniata. In leaving the Plateau we have also left behind the soft coal fields, and we now pass through ridge after ridge, cut into by the river. There are some farms in the lowlands between the ridges, and on the ridges themselves, Pennsylvania is trying to make forests grow again. Unless trees do clothe the hills once more, there will be a succession of great floods followed by great dryness, for the spongy soil of forests is needed to hold the rain water.

A little below the place where the Juniata joins the Susquehanna we come to Harrisburg, Pennsylvania's capital. Harrisburg is placed just at the point where the Susquehanna leaves the mountain ridges and comes out into a broad, rich valley. It stands, therefore, at a crossroads made by the Pittsburgh trail meeting the Susquehanna trail, and cities at crossroads are apt to grow fast. Like Johnstown, Harrisburg thrives on iron and steel.

Now we turn northward up the course of the Susquehanna. Though this river drains most of Pennsylvania, it

is so shallow and so filled with rocks that it cannot be navigated; but its valley makes a highway for railroads. After a time we come to its main forks, and we take the right hand stream. This leads us to a large valley about twenty miles long, the valley of Wyoming.

The first settlers of this valley, before the Revolution, spoke so glowingly of its beauty and its richness that it be-



A coal breaker near Pittston, in the Wyoming Valley. The grim, dark breaker buildings tower up in the landscape like castles of King Coal.

came famous even in Europe. In it there are still many farms but its wealth today comes mainly from the great beds of coal which underlie it. These beds are of hard or anthracite coal, which the pioneers called "stone coal."

The first hard coal which came to Philadelphia was brought in flat boats or "arks," down the Delaware. Some of the coal was lost in the rapids, and when the rest was

offered for sale, nobody knew how to make it burn. It was finally broken up small and strewn upon the walks of the public squares. Now we know how valuable this "stone coal" is.

Anthracite coal does not burn so easily as does the softer bituminous, and, therefore, is not desired for making steam; but, on the other hand, it is far cleaner to handle, keeps fire longer, and burns without giving off much smoke or gas. On this account the hard coal is preferred for heating houses. In the anthracite country the rocks have been folded and twisted so that most of the coal lies deep in the ground.

Seeing Hard Coal Produced.—And now we visit a hard coal mine. One of the miners takes us down hundreds of feet in an elevator, through a shaft. At the bottom we find tunnels running off to little rooms cut out of the coal. In these spaces are black-faced men, boring into the walls with noisy drills run by compressed air. When the holes are finished the miner puts into each a dynamite cartridge, lights the fuse, and goes away. Soon comes the blast, bringing a mass of coal crashing to the floor. The miner or his helper then takes a pickaxe, breaks up the big pieces so that they can be handled, and throws this loose coal upon a car which stands waiting.

Soft coal can be sold as it comes from the mine, but the big lumps of anthracite, when first brought out, also contain much black stone and slate. Into a tall building called a "breaker" go the cars of hard coal, and machinery crushes the coal into many fragments, some large and some small. Then the anthracite falls upon moving bars, which shake off to one side most of the stone and slate, or it is whirled around swiftly to accomplish the same purpose. Even after this it may be necessary for "breaker boys" to sit over the coal and pick out the useless material as the coal streams

between their feet. What a dusty job these boys have! "I'm glad I don't have to do that," says Jack. At last the coal is sorted into sizes and is ready to be taken to market. What size of coal is used in your furnace?

Cities of the Wyoming Valley.—The chief city of the Wyoming Valley is Wilkes-Barré, named after two famous Englishmen who upheld the American cause during our Revolution. Though the city itself is pretty enough, the country surrounding it is so filled with black coal breakers, lines of coal cars and great piles of coal dust and slate, that much of its beauty has been lost. We can do without the loveliness of this part of our country, however, as there are many more beauty-spots in Pennsylvania; but we cannot do without hard coal.

At the upper end of the valley there flows in a small stream with a famous name, the Lackawanna, and some miles up the Lackawanna stands Scranton. Two brothers by that name set up an iron furnace at the spot, and were the founders of this big city, third in size in Pennsylvania. Around Scranton one-fourth of the hard coal of the United States is mined, and in addition the city remains an iron and steel centre.

Scranton has silk mills which are among the largest in the world. Wherever there is much hard labor in manufacturing for men, there are found many of their wives and daughters who wish to work in mills. The silk mills give them labor which is not hard and is suited to the more delicate fingers of women. Silk manufacturing cannot be carried on well where there is much dust or dirt, so anthracite coal is used for power. The iron and steel cities of the hard coal regions are favorite places, therefore, for silk mills.

Beside the district in which lie Wilkes-Barré and Scranton there are only a few basins in which hard coal is found.

Everywhere else it has been swept away in the course of ages. These coal basins take in altogether only a little more than one-hundredth part of Pennsylvania, yet they hold almost all the hard coal of the United States. When these fields are exhausted there will be plenty more soft coal, but no



Mauch Chunk on the Lehigh River, which has cut a deep valley. The valley furnishes a highway for railroads that carry to market much hard coal. Find the dam across the Lehigh; what is its use?

more anthracite. Even now hard coal grows dearer all the time, and soon the day will come when only the rich will be able to afford its use.

Down the Lehigh—One of the river ways which leads downward from the neighborhood of the coal regions toward the Delaware, is the Lehigh River. It is a small stream; but

has an important valley. As we follow its winding course from the mountains, we see a heavy white cloud that rises from clusters of large buildings. The cloud proves to be dust, for in the buildings material is being ground up to make cement. "Please stop, I want to see how this is done," cry Jack and Fred in the same breath.

A workman who looks like a dusty miller takes us through the plant and explains, "Limestone and a brittle rock called shale are ground up and made into a powder. This stuff is blown through long, revolving ovens or kilns in which flaming gas roasts the material into little lumps of rock again. This new black rock is ground up once more into the fine white powder which is cement.

"When cement is mixed with sand, broken stone and water, it becomes concrete, or artificial rock. We can pour and mold this concrete, while it is "setting," into many forms. By its use we make buildings, bridges, walls, and pavements, in a short time. Builders could not do without concrete. The Lehigh Valley is the greatest cement making section in America."

The cement mills bring much money to the city of Allentown, just below them on the river. Allentown is also even more important in silk weaving than is Scranton, and she has iron and steel mills, too. Only a few miles farther along the river lies Bethlehem, known far and wide for its great steel works. Though peaceful Moravians founded the city, the steel mills across the Lehigh turn out cannon and armor plate for vessels, as well as other less warlike material. It was hard coal which made Allentown and Bethlehem into iron and steel cities, although they use anthracite in their furnaces no longer. What a wonderful group of workshop cities we find near the anthracite fields!

QUESTIONS AND SUGGESTIONS

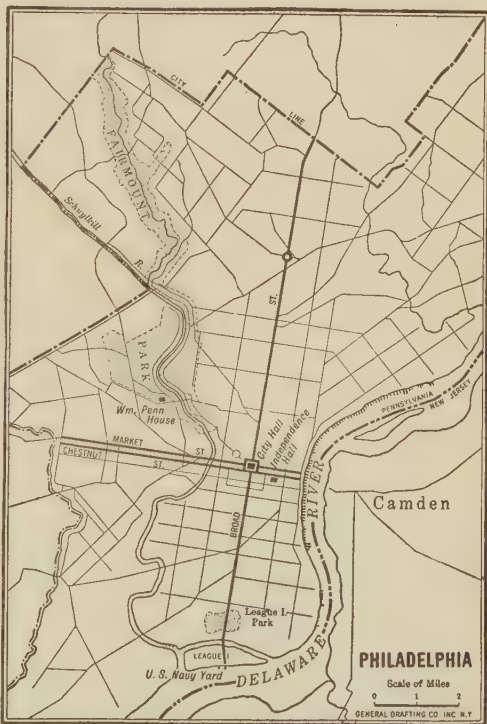
1. Why is it more difficult to mine hard coal than soft coal?
2. Compare the Susquehanna with the Hudson River.
3. What is the dustiest job about the coal mines?
4. Has cement been used to improve your home? How?
5. Bennie the blind door-boy and his brother Tom were trapped in a coal mine. Read in *The Blind Brother*, by Homer Greene, how they escaped.
6. Would you like to be an anthracite miner? Why?

CHAPTER XI

PHILADELPHIA AND ITS NEIGHBORHOOD

Penn's Choice.—Going southward from the mouth of the Lehigh, we find that the next good-sized river which flows into the Delaware is the Schuylkill, a Dutch name which reminds us that it was a ship in the Dutch service which discovered the mouth of the Delaware. On the land between the big Delaware and the smaller Schuylkill William Penn, the Quaker, founded Philadelphia, the "City of Brotherly Love."

Penn's choice was even better than he thought. His city soon became a prosperous seaport, for it lay in a fertile country and could buy many goods with its lumber, furs and grain. When manufacturing began and needed coal, the Delaware and the Schuylkill Valleys furnished roads by which anthracite was brought. Lying midway between the



northern and southern colonies, Philadelphia became, for a time, the capital of the United States.

Today there are only two larger cities in our country—New York and Chicago. Although Philadelphia is nearly one hundred miles from the ocean, the channel up the bay and the river is kept deep enough to admit the big ocean steamships which make the city one of the greatest American seaports. Beside this advantage, Philadelphia is the headquarters of the greatest railroad in the world, the Pennsylvania, which connects it with New York, only ninety miles distant, and by way of Harrisburg, Altoona, Johnstown and Pittsburgh, with Chicago. The Quaker City cannot help growing.

How Philadelphia Helps the World.—Along the Delaware we see big refineries of sugar from Cuba. The steamers bring in full cargoes of sticky brown sugar with plenty of molasses in it. The refineries boil this unpleasant looking “mess”, clear it, filter it, dry it, and out it comes as delicious fine white grains, which are packed in cardboard boxes to supply our homes. Petroleum comes to the city in steel tank steamers. The oil refineries along both rivers take this petroleum as well as that which comes in from far away by pipes, and manufacture gasoline, kerosene and oil for machinery. Uncle Sam, having a very sweet tooth, eats up almost all Philadelphia’s sugar, so she cannot send much abroad; but her gasoline and kerosene are sold in large tin cans all over the world.

“I saw a sign awhile ago,” remarks Alice, “which said that Philadelphia is the workshop of the world.” That is a good title. There is no other city which makes so many locomotives as does Philadelphia. She is famous for working in leather, in chemicals, and in iron and steel; but after all, her greatest amount of manufacturing is in “textile” goods—that is, goods that are woven on looms or knitted by ma-

clines. Suits of clothing for men and women, as well as underwear, stockings, rugs, sweaters, are made in prodigious quantities—why, if Philadelphia had no other factories, the textile factories alone would make her a city as large as Pittsburgh.

The visiting steamships take away wheat as one of their chief cargoes, and though only a small part of that wheat is raised in Pennsylvania, Philadelphia surely helps to feed the world. Through her kerosene Philadelphia also helps to light the world, and by sending many thousand tons of coal to New England and across the ocean, she helps to drive the wheels of countless factories and to warm countless homes.

A View of the City.—In the centre of the main business part of Philadelphia rises the enormous City Hall, whose tower rivals the Woolworth Building of New York. Upon this tower stands a gigantic statue of Penn, looking out northward over the city toward the spot where he made, under a great elm tree, a treaty of peace and good will with the Indian chiefs. Let's go up into the tower by elevator and "view the landscape o'er."

North and south from City Hall we see Broad Street, one of the show streets of Philadelphia. At its southern end we notice the buildings, masts and smokestacks of League Island, the greatest navy yard which our government owns. East and west, just underneath our high station, runs Market Street, one of the city's chief business streets. Near Market, Jack notices the tower of Independence Hall, "the most glorious structure in America," where Congress met during most of the Revolutionary War. In it is the best relic of our country, the Liberty Bell, cracked and silent, yet speaking to our hearts and minds.

Philadelphia, having been the largest city of the colonies and of our early days as a nation, is filled with memorials of those times. We come down from the tower and proceed

to freshen up our history. We visit the house of William Penn, and the first circulating library in America; we see Franklin's electrical machine, George Washington's watch, the sword of Paul Jones, the spot where Jefferson wrote the Declaration of Independence, and the graves of Franklin,



The Heart of Philadelphia, from historic Independence Square. In the background is City Hall Tower, with a group of office-buildings and hotels along Chestnut Street.

Robert Morris, and Stephen Decatur. "That historical trip around the Quaker City was great," declares Fred, as he rests his weary bones that evening.

"I never saw so many rows of small houses," says Ruth. That is true. So long has Philadelphia been a city of prosperous manufacturing, that its working people feel secure in buying houses. By means of societies called "building-asso-

ciations" they invest their money in two-story dwellings, each of which is the property of a family. In New York it is not usual for a family to live in a house of its own; in Philadelphia that is the common way. No wonder that the Quaker City is also called "The City of Homes."

The Oil Refineries.—Before we leave Philadelphia we should certainly look through her works for refining oil, which business is one of her famous industries. Under the rivers, through mountains, and across level farmland run the pipe lines of which we know, bringing the "life-blood of commerce" to the city. Some of the thick, dark liquid which we see pouring from the mouths of the pipes has been pumped fourteen hundred miles, from far away Oklahoma.

A great quantity of oil is also brought to the refineries by the steamships that we saw and that are nothing but big tanks holding millions of gallons of this precious fluid. Every day arrives some tank steamer from Louisiana, Texas, or Mexico. The refineries all stand on the banks of the Schuylkill or the Delaware, because it is best to be where steamers can come alongside of the refinery to discharge their crude oil or to take on refined oil to be sold abroad. This saving of time and trouble is called efficiency, and all efficiency in the end is a help to all of us.

Once arrived at the refinery, the "crude" oil goes into "stills," where it is heated. At a certain heat gasoline is given off, at another, kerosene, then the remainder is filtered to separate the light oils for machinery. What is left may be used as fuel oil, to burn instead of coal. These products are only a few of the many which come from the marvelous "rock oil."

Through the Back-country.—Now we turn back to Philadelphia and follow the Schuylkill up through beautiful Fairmount Park, and past many manufacturing plants, until,

twenty miles from the city, high hills appear. This spot is Valley Forge, where Washington's patriots endured a distressful winter. It is now owned by the state, and with hearts full of gratitude to the noble leader and his faithful men we may wander through hundreds of acres, at every turn seeing some memorial which rouses patriotic feeling.

Here stands a counterpart of the tiny huts in each of which lived twelve miserable soldiers; here are the intrench-



Washington's Headquarters at Valley Forge. This house was the residence of the forgemaster, Isaac Potts. Lafayette, Wayne, Hamilton and many other famous men, came beneath its roof.

ments over which they mounted guard; here swell the graves of their many dead; here are statues of their leaders. Near the Schuylkill is the little stone house in which Washington made his headquarters (though not, you may be sure, until his men were safely housed), and on a neighboring height rises the Washington Chapel, the central feature of Valley Forge.

Forty miles up the Schuylkill, not far from the coal fields, we come to Reading, laid out by sons of William Penn, and

named after an English city. Being situated in the old days near good supplies of iron and coal, Reading became an iron manufacturing community, and though it now gets neither iron nor coal from nearby, it stays in the iron and steel business.

Between Reading and Philadelphia lies beautiful, rolling country, a region of good farms, which takes in the whole southeastern part of Pennsylvania. If we go southwest from Reading we shall find ourselves at the city of Lancaster, which stands in the "creamiest" part of this region. Here the limestone soil is so rich that the farmers need enormous barns to house their crops. We admire the fat cattle, and the rich fields of wheat and clover. We see also many acres of broad-leaved tobacco, which grows well only in good soil, and in Lancaster itself we notice a number of cigar factories. This is the garden spot of Pennsylvania and one of the richest in America. Lancaster is about as far from Philadelphia as is Reading, and the main line of the Pennsylvania Railroad will soon bring us back to the Quaker City.

QUESTIONS AND SUGGESTIONS

1. What seaports have you visited on this journey?
2. Make a list of the "raw materials" which Philadelphia uses in her chief manufactures.
3. How does Philadelphia help to provide the world with food, clothing, and shelter.
4. From your history, make a list of famous events which happened in Philadelphia.
5. Would you rather have a farm in a land of granite or a land of limestone? Why?

CHAPTER XII

THE GARDENS OF NEW JERSEY

The Shore of the Delaware.—A ferryboat takes us across the Delaware to Camden, which faces Philadelphia. Much manufacturing is done there. It is probable that your grocer gets his canned soups from a Camden establishment. “My phonograph and its records came from Camden, too,” exclaims Ruth.

We ride northward along the Delaware, by New Jersey orchards and fields. The busy commerce which we saw at Philadelphia grows small on the river above, wide and pleasant though it is, for few ocean steamers dare to try the narrow and shallow channel. There are river boats, but they stop at Trenton, thirty miles above.

At Trenton is a stretch of rapid and rock-studded water, which even rowboats find it hard to pass, and which blocks all large vessels. This rapid marks the Fall Line, where the river descends from the rolling country of the Piedmont, east of the mountains, to a very low, flat plain which extends to the Atlantic, and is therefore called the Coast Plain.

Cities of the Fall Line.—The Fall Line is a remarkable feature. For hundreds of miles it can be traced on the rivers that flow to the Atlantic, and on the important rivers, cities have grown up at that point. Through Baltimore, Washington, Richmond, Columbia, Augusta, Macon, Columbus, and Montgomery—so runs the Fall Line from New Jersey to Alabama. On what rivers are Washington, Richmond, Augusta, and Montgomery?

“Why have cities grown up on the Fall Line?” asks Alice. For two reasons. Let us take Trenton as an example.

In old times, before railways were built, and when roads were bad, goods were carried on rivers whenever that was possible. A sailing vessel could bring the cargo up to Trenton but there it had to be unloaded and carried on by pack-horse or wagon. The vessel would then take on cargo at the same place. At Trenton there was a constant coming and going of people, and of course it became a trading place.

The rushing waters of the "falls" or rapids turned the wheels of saw mills or grist mills which attracted more people to the trading place. When manufacturing in factories be-



Photo. by Alfred G. White

Potteries at Trenton. Notice the funnel-shaped kilns (pronounced "kills") in which the pottery is baked. The canal in the foreground once was a great help in bringing raw material and taking away the finished pottery. Why does it not help much now?

gan in our country, the water power proved very valuable, so that the Fall Line towns became manufacturing towns; they remained so even after coal came into use to make power. The Trenton manufacturers set up many potteries, which get special kinds of clay from regions as far away as Florida and England. "Fred," cries Jack, "do you suppose that our nice white bathroom furnishings came from Trenton?"

A Seashore City.—Now, in our automobile, let us travel southward from Trenton. We are bound for a dip in the ocean. Our motor takes us through level New Jersey fields of corn, wheat, and potatoes, looking like many of the Pennsylvania farms, but after a time evergreen trees become abund-

ant, the land grows sandy, and houses are fewer. Here and there is a "cranberry bog"—a field surrounded by ditches so that it can be flooded to kill insects and weeds or to keep the plants from freezing. In September the pretty red berries hang thickly among the leaves.

Finally a smell of salt takes the place of the smell of pine needles. Facing the blue Atlantic, tower up the great hotels of Atlantic City, the greatest seashore summer resort of the world. Would you like to stroll along the miles and miles of wide boardwalk and buy at the stores that line this avenue? Would you prefer to jump into the waves, or ride a horse along the beach, or listen to a concert on one of the piers, take a yacht trip or an airplane excursion, or merely sit in the sunshine and watch the thousands of bathers that throng the beach? Enjoyments are many and various at Atlantic City.

In winter the climate of Atlantic City offers a relief from that of inland places. Father Atlantic, who furnishes cool breezes in summer, warms up the air in winter, and many an invalid finds it healthful to make a journey to this resort at that season. "Every week is seashore week at Atlantic City, I think," observes Ruth. A chain of other seaside resorts extends along the whole ocean coast of New Jersey.

Juicy Truck.—On our road back toward Philadelphia, we swing around to the south of New Jersey. Here the soil is still sandy, but there are fewer pine trees and much more farming. In the fields we may see, according to season, peas, asparagus, onions, beans, canteloupes, watermelons, peppers, or tomatoes. There are many orchards of peach trees.

"Where are the grain fields?" we ask, and the answer comes, "This soil is not usually rich enough for grain, and the farmers who persisted in trying to raise it had to give up. Then people found that 'truck farming,' the growing of vegetables and fruit, was possible. They cultivated smaller

fields and made more dollars for each acre. Grain could be raised in the west and brought long distances, but the big cities called for fruits and vegetables, which are best when produced nearby."

The truck growers raise juicy products, which get most of their food from the rain and the sun, and when they need richness in the sandy soil, they buy bags of fertilizer and put that on the land. Many of the truck farmers are Italians, who are used to working hard on small farms. Once people thought that the "Jersey Pines" would never be worth anything for raising crops; but those people should see what abundance is produced now. So much is known about farming today, that almost any soil is good for some special crop, provided that there is sunshine and water enough.

QUESTIONS AND SUGGESTIONS

1. How can a wide river be unfavorable for navigation?
2. What inventions and improvements have taken away some of the old-time importance of rivers? How have rivers become more important in certain ways than they formerly were?
3. Why is the Fall Line so important?
4. Why does the sandy soil of southern New Jersey favor truck-farming? How does it sometimes hinder truck-farming?

CHAPTER XIII

ALONG THE CHESAPEAKE

Wilmington and Baltimore.—Thirty miles below Philadelphia we come to Wilmington, which contains half the people of the little state of Delaware. Wilmington resembles Philadelphia in making leather, paper, and articles of iron and steel. Here, too, as well as farther upstream near Camden, and in Philadelphia, are famous shipyards. Perhaps of all her manufactures, however, Wilmington is proudest of that which was started long ago by two young Frenchmen, who began to make gunpowder. Their business prospered; now it has many branches and beside manufacturing all kinds of explosives, it turns out enormous amounts of artificial leather, artificial ivory, and many other things which do not seem to have any relation to dynamite and gunpowder, although, in fact, they are made from some of the same material.

A ride of an hour and a half from Wilmington in the Baltimore and Ohio train brings us to Baltimore, the "Queen of the Chesapeake," larger than Pittsburgh and about the size of Boston. The first steam railroad of America, the Baltimore and Ohio, began here, and over its lines from West Virginia Baltimore gets coal for manufacturing. Much of the iron ore from which Baltimore makes steel, however, comes from our neighbor Cuba.

Though Baltimore has many factories, trade by water means more to her than it does to Philadelphia. Most of the oil for her refineries is brought from Mexico and has to come by steamer. Heavy bars of copper, very impure, arrive

from Spain, in order to be refined for our electrical workers. She outdoes Philadelphia in sending grain abroad.

Airtight Food.—Perhaps the most picturesque industry of Baltimore is the canning industry, which depends on both the lands of the Coast Plain and the waters of Chesapeake Bay. As the Coast Plain continues southward from New Jersey it spreads out wider and wider, thus giving more and more room for truck farming; and the farther we follow it south, the milder grows the climate. The truck crops of eastern Maryland ripen before those of New Jersey, and how abundant they are!

In the days before railroads came, people had to depend on the fruits and vegetables raised nearby. Later on, the railroad train carried such "green food" for long distances very quickly, but unless it was bought and used soon, the peaches, strawberries, and tomatoes spoiled. What a blessing it was when clever men invented canning! Now we can get all kinds of health-preserving food throughout the winter, and it can be kept on our pantry shelves for years, ready to be eaten at any time. The greatest kings of ancient times could not have such good and varied food as we enjoy.

The most popular vegetable for canning is the tomato; the most popular berry is the strawberry; and the most popular fruit is the peach. All these grow well in the soil of the Coast Plain. Hundreds of big and little canning factories are scattered throughout the Plain of Delaware and Maryland; but the great canneries are in Baltimore.

All regular steamboats which run on the Bay come to Baltimore, and in the harvest season many "market boats" stop at little wharves where the steamboat never calls, and load cargoes for the Baltimore canneries. From rhubarb and asparagus in the spring, to pears, apples, and pumpkins in the fall the canneries keep busy. As soon as fall comes,

moreover, the fishing boats begin to bring in oysters. Let us take a little trip on one of these oyster schooners.

Oysters in the Shell.—As we sail, the captain tells us that Chesapeake Bay is the best place in the world for oysters, who love its warm, shallow, salty water. We pass stakes set into the bottom to mark oyster beds which are owned just as are strawberry beds, but our boat sails on until we come



Oystering in Chesapeake Bay. The tiny young oysters swim around until they find a firm foundation to attach themselves and settle down for life.

to a bed which is free to all. The men drop into the water a big, heavy iron net looking like a purse and the boat pulls it along, thus raking up a load of oysters. By turning a windlass, this "dredge" is hauled on deck, and here are our oysters—but not on the half-shell!

"Captain, why is it that the months whose names have an "R" are the months for eating oysters?" asked Ruth. "Those are the cool months," replies the captain, "which

make the oyster firm but juicy. In warm weather the oysters grow fast, but are flabby and do not taste so good."

"What do the oyster boats do in the warm months, then?" comes Alice's question. "They fish, or go out after crabs," the captain says. Many millions of crabs are taken every year from the bay, and a large amount of crab meat is canned in the Baltimore canneries which "put up" oysters. Thus the Minnesota iron miner, far away from the ocean, can get appetizing sea food.

Down the Bay.—The captain agrees to take us down the Chesapeake, so that we may see the full length of the largest bay on the Atlantic coast. The Chesapeake is really a "drowned river," like the Hudson. It is the lower part of the Susquehanna, and was formed by the sinking of the coast, making a bay two hundred miles long. The southern part of the bay is in Virginia waters.

Not many miles below Baltimore we stop at a pretty, old-fashioned town beside a blue river. This is Annapolis, whose State House tells us that it is the capital of Maryland, though the community scarcely seems large enough for that. Here is the Naval Academy, where Uncle Sam educates officers for the navy as West Point educates officers for the army. The Annapolis "middies" and the West Point "cadets" have a wonderful time when their football teams battle on the gridiron each November. "Oh, I want to see that game some year," shouts Jack, all excited.

Peanuts to Roast.—At the lower end of the Chesapeake we come to rapidly growing Norfolk.

As you may guess, Norfolk has a great trade in fish, crabs, and oysters, but her land crops are more important than her water crops. The land is flat around Norfolk, and to the south lies the Dismal Swamp, from which much lumber is cut—but lumber is not the chief support of the

city. Norfolk is also quite famous as the "Peanut City of America." Did you ever buy any peanuts when you went to the circus? Alice and Ruth, Fred and Jack walk along the Norfolk streets, each munching away from a big bag of them.

Peanuts are raised in many southern states beside Virginia, but nowhere else in such plenty as around Norfolk. The farmer plants the shelled nuts in the ground just as



A peanut digger. What other crop is dug in much the same way? What is the use of the peanut vines? What crop borders the peanut field?

he would plant corn. When the sun shines warm, green vines peep from the ground; they grow, they blossom, then they dig down again into the soil and ripen the nuts underground. The vines, when dried, make nourishing hay for the animals.

On the Norfolk wharves we see thousands of burlap bags stuffed with peanuts and waiting for the steamer—but selling peanuts is not Norfolk's greatest business.

Green Food.—The flat soil around Norfolk might be swampy if it were not so sandy. It is very rich, and is fine for truck crops. When the big cities of the east grew so big that the farms nearby could not supply enough vegetables

and berries, someone thought of Norfolk, which was able not only to raise a vast quantity of truck but also to ship it cheaply by water. Now Norfolk, once a sleepy place, is one of the greatest truck centres of the United States, and is a very, very busy city.

More than half of Norfolk's truck goes to the city with the biggest appetite—New York. Fast steamers travel from one city to the other in less than a day, so nothing has time to spoil. Spinach, lettuce, radishes, peas, strawberries, early potatoes, all pour into New York before any northern truck-farmer can raise them. Later on there are cucumbers, cabbage, beets, beans, sweet potatoes and white potatoes—a great assortment. Boston, Philadelphia, and Washington also receive a share of Norfolk's health-giving crops.

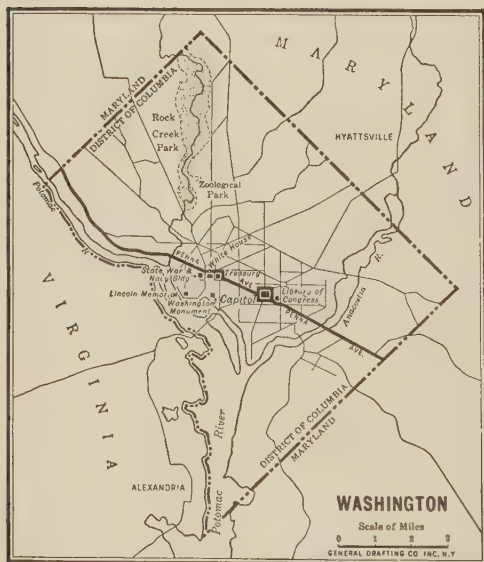
QUESTIONS AND SUGGESTIONS

1. How is cotton connected with manufacturing explosives?
2. In the nearest grocery store, see how many kinds of canned goods you discover.
3. Make a list of various kinds of truck not mentioned in this chapter.
4. Learn more about our fine Naval Academy by reading *Buck Jones at Annapolis*, by Richmond Pearson Hobson.
5. How would you gather oysters if your boat were so small that a heavy dredge could not be used?
6. Where would be the mouth of the Susquehanna, if it were not a drowned river?

CHAPTER XIV

OUR GOVERNMENT CITY

Fair Mount Vernon.—Again we embark on a steamer; soon we have left behind the busy wharves of Norfolk, as we take our way up the Chesapeake. After a time the ves-



sel turns to the left and enters the big, yellowish Potomac River. For many miles the boat holds her course between Maryland and Virginia, then above our heads the steamer's bell begins to toll, slowly and solemnly. What can be the reason? "We are approaching Mount Vernon," says an officer, "and this is a sign of respect

at Washington's tomb. The President's yacht and all of the United States Navy dip their colors as they pass."

Here we leave our boat, for we must surely visit the home of Washington. Of Mount Vernon he became the owner when but a young man of twenty; to Mount Vernon came his handsome bride, Martha; at Mount Vernon he loved to farm and entertain; in Mount Vernon he died, and there

his body rests. We follow the path up the hill, stand in reverence a moment as we pass the plain brick tomb, and sit awhile in front of the mansion to look out, as Washington often did, upon the fair river and the Maryland shore two miles distant.

An association of patriotic women keeps the house and grounds as they were in the great leader's time. There are the gardens where Martha Washington loved to walk along the box-hedged paths; there is the clumsy family coach in its shed, and the quarters of the slaves. Within the mansion is a multitude of relics; the girls like the quaint kitchen, with its fireplace, its crane, and its saucepans, as of old, and the boys peer into the room in which Washington died, seeing that it has the very furniture which he used. We go away from Mount Vernon better Americans for having "The Father of His Country" thus brought near.

Washington the Beautiful.—A smaller steamer takes us on again. We are approaching the city named for our first president. Long before we have covered the seventeen miles of journey remaining, we see before us the buildings of the city of Washington, the capital of our republic and the most original city in the United States.

"I think that the capital of our big country should be located near its centre, perhaps in Kansas," says Fred thoughtfully, "but Washington lies in the far eastern part of the United States." When the city was located, however, few thought that the wealth and power of the country would spread much beyond the Appalachians for a long time. The capital was therefore set almost midway of the few states that were then in the Union, and the future was left to take care of itself.

No other city of the United States can compare with Washington as a place in which to learn our history. Its

broad avenues, its shaded parks, its great government buildings, and its wonderful memorials make it a centre for intelligent Americans. It did not grow of itself, it was created by Congress. The capitals of other large nations were selected because they were already large cities, with manufacturing and commerce. Washington, although in the second century of its age, has no manufacturing of any



The Capitol at Washington. Washington himself helped to select its situation. For years it was known as "the palace in the woods." Have you ever seen the capitol building of your State? How did it resemble the National Capitol?

consequence, and its sky is undimmed by smoke. Truly, it is Washington the Beautiful.

Our Capitol.—From the steamer's deck we see, across green Potomac Park, a dome rising against the blue; it is our national Capitol, the crowning glory of Washington. We make that the first place of visit. As we toil up the long flights of marble steps which lead up Capitol Hill, we have ample time to admire the columns which surround the dome and to observe the bronze statue of Freedom which adorns

its top. Freedom was set in her place in the midst of the Civil War, as a token that the government at Washington believed that the cause of liberty would triumph.

Beneath the dome is the great "rotunda" or round space, surrounded by paintings and carvings representing events in American history. On one side of the rotunda the black-robed, solemn-looking justices of the Supreme Court, the highest law officers of our country, hold their sessions. On the other side is a hall where stand marble statues; each state may send there the images of two of her best men or women. Here we may see the figures of Robert Fulton, Thomas Jefferson, and many another famous person. In one wing of the Capitol the Senators meet, in the other wing the Representatives.

White Library and White House.—Adjoining the Capitol on the east is the great Library of Congress, topped by an enormous golden dome which forms a fitting companion to the white dome of the Capitol. This Library contains the largest collection of books in America, exceeded only by two other libraries in the whole world. Of every book, magazine, and printed picture published in the United States, the Congressional Library must receive copies. A thousand readers may study at once in its central hall, undisturbed by the visitors who wander through the marble passages.

Now from the western front of the Capitol we shall wander along broad Pennsylvania Avenue, probably the most famous street of Washington. Every new President has passed along this avenue to take his oath of office in the Capitol. We go in the other direction, and after walking a mile we arrive at the home of our Presidents, the celebrated White House. During the War of 1812, the British captured Washington and partly burned this building. The smoke

blackened walls of the mansion still stood, and when it was rebuilt they were painted a snowy white. Ever since that time our "Executive Mansion" has been called the White House.

Of course we are interested in looking inside the President's home. Entering through the porch with its two-



Lincoln Memorial at Washington.

story columns, we step into the East Room on our left. This occupies the whole side of the mansion, has wonderful crystal chandeliers, and the President uses it for the special receptions which he gives from time to time. Perhaps as a favor we shall be allowed to look at other rooms—the Blue Room, where the President stands to shake hands with those who attend the receptions; the Green Room, the Red Room, and the State Dining Room, from whose walls look down heads of game which fell before Roosevelt's rifle.

The White House is a much finer place now than when Abraham Lincoln's boys romped through its rooms.

The Monument and the Memorial.—Behind the White House, overlooking the Potomac, stands the highest monument in the country, erected in honor of George Washington. Tall, firm, and graceful is this marble shaft—a fit monument to the man we honor most. Would you like to see the fine view from the top of the monument? No, not from the outside—there is a room at the summit with little windows from which to gaze. You may have your choice of walking up nine hundred iron steps—round and round and round and round—or being taken up in a crawling, creeping elevator. Which do you choose? Jack and Fred decide to return by walking down the nine hundred steps, but when they reach the ground they are both tired and dizzy.

Further on in the same direction is a giant building, approached by many steps; it looks like a Greek temple. This is a memorial to Abraham Lincoln, just as the Monument is a memorial to George Washington. Inside the memorial we find a great statue of Lincoln, as he appeared in war-time, thoughtful and careworn with affairs of government. Though seated, the statue is five times the height of a tall man. Perhaps that shows how great Lincoln appears to us today. On one side of the hall is a painting representing "Freedom," on the other side a painting of "Union."

As we go out of the vast hall, there in front of us is a long, clear pool of water, reflecting the Washington Monument. One look at its beauty, and we turn to gaze again at Lincoln's face. Two memorials are thus associated, honoring two great men, each of whom, in his own time and way, brought to us Freedom and Union. In Washington, indeed, every day is Memorial Day.

QUESTIONS AND SUGGESTIONS

1. Who is the Senator representing your family in Congress? Who is the Representative?
2. What precious articles did beautiful Dolly Madison save from being burned with the White House?
3. Make a list of the great memorials which Washington contains.
4. How is it that Washington can be a large city without manufacturing?
5. On a map of the United States, put your pencil-point where you **think** the central spot is situated. Do your friends agree with you?

CHAPTER XV

TOBACCO LAND

On to Richmond!—"From Washington to Richmond! On to Richmond!" was the cry of the North during the Civil War; but it took four years of struggle before Richmond was reached. We are more fortunate. A southward journey of something over a hundred miles from Washington brings us in less than four hours to the old-time capital of the Confederate States.

The city stands on the Fall Line, where the James River rapids, six miles long, descend a hundred feet to tidewater and give much power. It is a fine situation, and Richmond has grown in response to the water power and the coal fields not far away. No other city of Virginia approaches Richmond in size, and it is naturally the capital of the state.

In order to recall some of our country's famous men, we visit the state capitol, which Thomas Jefferson designed. We stand in old St. John's Church, and imagine that we hear Patrick Henry making its roof resound with, "Give me liberty or give me death!" "I can recite part of that oration now," says Jack, "and I'm going to learn the rest." We gaze at the White House of the Confederacy, for several anxious years the home of Jefferson Davis, and we enter the house where General Lee lived after the Civil War ended, and see the relics which have been collected there. History brings to mind many pictures of those bygone days.

The Tobacco Fields.—As we go about the streets on our historical trip, Alice wrinkles up her little nose and exclaims, "Oh, what a strong smell of tobacco!" Richmond is one of

the great tobacco centres of the United States, for Virginia is one of the greatest tobacco states. In the many city factories, presses make solid "plugs" of tobacco, machines roll cigarettes and change tobacco into fine grains for smoking, while the hands of people are needed for making cigars. "It will be interesting for you to visit my tobacco fields," says a farmer whose acquaintance we make.

Along the roads on our way we see many rows of sprawling tobacco plants with dark green leaves a yard long and



A field of tobacco. Notice the tobacco barn in the background. Who introduced tobacco to the civilized world?

stalks as big as our middle finger. "Isn't it strange to think," remarks the farmer, "that such a large plant can grow from seeds so tiny that you could carry a million in your pocket? I tell you I have plenty of work to do. I must raise young plants in a special bed, set them out in the field, cultivate them, pick off various kinds of worms which devour them, pinch off the blossoms, and break off the side shoots."

"What is that frame building out in your field?" asks Fred, as soon as we arrive.

“ That is my tobacco barn,” answers the farmer. “ When the leaves begin to turn yellow I pick them carefully and hang them in the barn to be ‘ cured ’ or ripened. Some barns are built with cracks through which the air can blow ; some barns are built very tight and are heated with stoves whose pipes or flues run through the barn. The people of Virginia like the first method, the people of Ohio prefer the second. For about a year the tobacco stays in the barn before it goes to market.”

Tobacco or Truck.—Taking care of tobacco is a busy job, but much of it is not heavy work ; if your father were a tobacco raiser, you and your sisters and brothers might be asked to work many a day in the tobacco fields. It takes only a few acres of tobacco to keep a full-grown man employed all the time ; so the tobacco fields are not usually very large. The farmer, however, expects to get almost all his money for the year from those acres of tobacco. He is willing to put a great deal of care on them, for he gets eight or ten times as much cash from an acre of tobacco as he would from an acre of wheat.

“ These big sprawling plants,” says the farmer, “ are big eaters. They will grow well only on rich ground, and they eat the richness out of that very fast. I must often put fertilizer on my land. Many of my neighbors, in order to avoid buying fertilizer, unfortunately moved their tobacco to new fields, and left the old fields bare. Then the heavy rains washed the bare ground into deep gullies and carried away the firm soil until the field was entirely spoiled.” As we travel through Virginia and on into North Carolina we see many of these spoiled fields, good for nothing.

North Carolina is a rival of Kentucky for the first place in raising tobacco. Most of her tobacco is in the Piedmont

region, which has richer soil than the Coast Plain. The Coast Plain, however, once considered so poor, is now prosperous from the raising of truck. Those fields are part of that great garden which extends along our coast from New Jersey to Florida, and send a stream of green vegetables to the cities.

We visit tobacco factories in Winston-Salem, but we find that they are like those in Richmond. It is summer, and the heat of the Piedmont grows oppressive. Let us go westward to the mountains for a breath of cooler, clearer air.

The Land of the Sky.—In North Carolina the Appalachians reach their greatest height. Twenty-seven of the mountains rise higher than Mount Washington. The Cherokee Indians loved these wild heights, and called the region "The Land of the Sky." Some of the Cherokees live in North Carolina to this day. To the "Land of the Sky" come many visitors, attracted by the wonderful scenery, the stately forests, and the mountain air.

At the centre of this region lies the city of Asheville, in a high valley surrounded by mountains. So high it lies that in summer the nights are refreshing, and so well is it protected from winds that the valley is warm in winter. During all the year, therefore, Asheville welcomes the stranger. From the city lead many roads to the various national forests which the government has established. One of these forests is named for Daniel Boone, who lived and hunted in North Carolina.

Of course, we wish to climb to the top of Mount Mitchell, which is the summit of the Eastern States, and is not far from Asheville. A roughly constructed railroad train takes us by winding ways up the face of the mountain. When we reach the top a monument confronts us. "I wonder what

it's for," observes Ruth, and a forest guard who has just come up, replies, "It is to Elisha Mitchell, professor at the University of North Carolina and state surveyor, who loved this mountain; by his measurements he proved it to be the giant of the Appalachians."

One June day Mitchell, who was nearly sixty-five, though strong and vigorous, started out to explore the mountain



On the French Broad River, below Asheville. This river in "The Land of the Sky" is subject to sudden floods, and usually runs yellow from the soil washed down toward the Tennessee River.

still further. Four days later, when he had not appeared, a party went out to find him. After nearly a week of searching the forest, they discovered his body in a mountain pool into which he had fallen. Now Mitchell lies buried on this height to which his name has been given. He would have chosen his grave here, looking out over a sea of ridges and peaks, and he would have rejoiced that so many people find pleasure and health in this beautiful "Land of the Sky."

QUESTIONS AND SUGGESTIONS

1. Are the capitals of the states which you have visited the largest cities of those states? Make a list to prove your answer.
2. How can farmers prevent rain from making gullies in their fields?
3. How do the forests around Mount Mitchell differ from those around Mount Washington?
4. What mountain is the summit of Maine? of Vermont? of Massachusetts? of New York?
5. Why must a tobacco-farmer pinch off the flower buds of his plants?

CHAPTER XVI

KING COTTON

The Cotton Belt.—In North Carolina we begin to see many fields that look as if snow had fallen in spots upon them. It is late summer, so this cannot be the case. “Oh, yes, now we know!” cry Alice and Ruth. These are cotton fields, and the snow is the ripening clusters of fibers.

The whole southeastern part of the United States raises so much cotton that it is called the Cotton Belt. In the belt are the states of North Carolina, South Carolina, Georgia, Alabama, Mississippi, Louisiana, Texas, Oklahoma, Arkansas, and Tennessee; you see that the Cotton Belt covers a large area. Big Texas raises most of all; indeed, it produces about as much as any three of the other important cotton states.

Tobacco and cotton fit together well in North Carolina, for both need rich soil, plenty of heat, and plenty of rain in summer; cotton, however, needs more warm weather than does tobacco. Therefore, it is hardly produced at all in the great tobacco states of Virginia and Kentucky, which lie farther north.

From Field to Bale.—The fields of cotton are beautiful at many times. The dark green plants, which are usually about as high as a person's shoulder, bear fine creamy flowers within two or three months after the cotton has been planted. Soon the cream turns to pink, so that the field seems full of wild roses. Then the flowers fall and the brown “cotton boll” appears. It grows to the size of a walnut and bursts.

Out spring the fleecy, white fibers, surrounding a good-sized dark seed.

Now the pickers, mostly negro men and women, enter the fields. Each picker pulls off the ripe cotton and thrusts it into his bag. When the bags are full they are weighed and sent to the "gin house." Eli Whitney's cotton gin, "gin" meaning "engine", was a wonderful invention. It made cotton cheap because it enabled a machine instead of



A rough ginning and baling establishment in the midst of the Southern cotton-fields
The press at the left makes the cotton into a big package or bale.

a hand to separate the fiber or "lint" from the seeds to which it tightly clings.

Great presses now squeeze the cotton fiber into bales, each about five feet high and five hundred pounds in weight. When the bales have been wrapped in sacking, iron or steel bands are put around them, and they are ready to be shipped. The cotton peeps out through so many holes in the sacking that the bales look rather untidy.

Saving Freight.—"Since the Cotton Belt is so big," says Jack, "our country must raise a lot of cotton." Yes, our

United States is the greatest cotton country in the world, just as it is the greatest tobacco country. The rest of the world cannot produce enough cotton for its own needs, and since cotton is the cheapest clothing material, the world must have cotton. We send an immense amount of cotton abroad. If we stop doing so, millions and millions of people, especially in England, would be thrown out of their work in the cotton mills.

For many years most of the cotton which we used in this country went through the mills of New England. At last, however, thinking people in the South began to say, "It does not seem right to ship our cotton up to New England and then buy back again cotton cloth for us to wear. To let our cotton take two railroad trips, one away and one back, seems far from being an efficient way of doing, and we have to pay for the two railroad rides."

Cotton mills, therefore, were set up in the South and proved very profitable. Today there are few cities of any size in the Cotton Belt without at least one big cotton mill, whose brick chimneys tower above the houses and whose whistle gives the people the time of day. Some of these mills are run directly by water power, as at Augusta, where canals from the Savannah River carry to them a large amount of water. Many mills operate by steam, and some get the power to turn their wheels from electricity, made by the force of the streams which tumble down from "The Land of the Sky."

Mill Centres.—"Let me introduce myself," says a pleasant man. "My name is Brown, and I sell machinery to these mills. Charlotte in North Carolina, Columbia in South Carolina, Atlanta and Macon in Georgia, all are big cotton mill centres. Many of the "poor whites" of the Piedmont

and the "mountain people" of the Appalachians have come to these cities and found employment at good wages for the first time in their lives.

"Today the Southern mills actually use much more cotton than do those of New England, but the New England mills have more workers and make finer, more valuable goods. It will be many, many years before New England gives up her



This Mississippi River steamboat draws but little water, even when loaded with cotton bales, as you see. In front is a hoisting device.

cotton mills, but we Southerners are glad that the cotton mills have brought prosperity to the South."

The Useful Seed.—"King Cotton" has more than one gift for his people. Beside the fiber or "lint" there is the seed. Once upon a time people threw away these dark kernels, thinking that they were just rubbish. Now they have found in the cotton seed more treasure than pirates ever owned. The seeds are full of oil, which is pressed out by rollers, and is worth hundreds of millions of dollars a year.

"I never saw this cotton seed oil," remarks Fred. Well, you have used it, Fred, whether you knew it or not. It is in many soaps; it is in the cans of cheap sardines; the oil sold in groceries as "salad oil" comes from cotton seed, although many people think it is real olive oil. Butterine or oleomargine, a substitute for butter, contains this oil.

The Mexican Bandits.—Almost every plant has insect enemies, and the great enemy of the cotton plant is the boll weevil. In 1892, while people were thinking about celebrating the four hundredth anniversary of the discovery of America, a number of Mexican bandits, in the shape of little beetles with long snouts, stole across the Rio Grande into Texas. No Texas Ranger could keep them out or drive them back. They pierced through the cotton bolls and fed on the unripe fibers, thus entirely spoiling the cotton.

Year by year the boll-weevils continued their march—thirty, forty, fifty miles each twelve months, spreading out through the Cotton Belt. Now they have invaded all of that region and cause tremendous losses, one-third to one-half of the total crop. What can be done to check the ravages of these little bandits? Some cotton growers dust the plants with poison, some try to raise cotton which will ripen early before the weevils grow numerous, and some destroy the old cotton stalks which harbor the grown-up weevils.

Other growers say, "Well, we shall not try to make cotton a king any longer. It shall not be our chief crop. We shall raise more corn, peanuts and other crops, which pigs and cattle like to eat. Then we shall sell the animals." This is what the farmers of a county in Alabama did, and it paid so well that they put up in their public square a monument to the boll-weevil, saying that it was a blessing in disguise. The United States and the world, however, need so much cotton, that it would be well to stamp out the weevil if that can be done.

Lenoir Rhyme College
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QUESTIONS AND SUGGESTIONS

1. On an outline map of the United States show the Cotton Belt, using any color you choose.
2. What are the signs of good cotton climate?
3. Why does any cotton go from the South to the New England mills?
4. Rena Llewellyn was a little girl who grew up in the sunshine of a big plantation. Her experiences are told in the book, *In the Land of Cotton*, by Dorothy Scarborough.
5. In *The Power and the Glory*, by Grace MacGowan Cooke, read how the girl Johnnie, who had never seen a town, walked down from the mountains to find work in a cotton mill.
6. Name some states which could use oil-cake to good advantage? Why?
7. Do you think the boll-weevil has been a good or bad thing for the South? Why?

CHAPTER XVII

FROM ATLANTA TO THE SEA

Busy Atlanta.—Almost at the far southern end of the Appalachians lies the city of Atlanta, to which we now come. Such a thriving, growing place it is that some people call it “Active Atlanta.” We shall find no other city so large which is so high above the sea, until we come to Denver, Colorado, far west of this point. Atlanta is fairly cool in summer because of its elevation, yet its climate is mild in winter because the city is so far south. No wonder that its people feel like working! Atlanta’s most popular name, however, is, “The Gate City,” marking the fact that she stands on the boundary between the mountains and the lowlands, and at the beginning of a good passageway across the Appalachians.

Atlanta has a famous neighbor, the city of Birmingham, which is growing even faster than Atlanta. A train carries us westward into Alabama, and in a few hours we enter Birmingham. The name of this community tells us its chief industry, for the English city of Birmingham has long been famous as the greatest iron and steel centre of the British Isles.

Cooking Steel.—Birmingham, like Atlanta, is on the outskirts of the Appalachians. After the Civil War it was discovered that a mountain of iron ore, fitly called Red Mountain, was bordered by a valley of coal, and that great beds of limestone lay near. Coal, iron ore, and limestone—what is the result? “Iron and steel manufactures, of course,” answers Alice, promptly. Because these three valuable materi-

als lie so close together, it is said that Birmingham can make steel more cheaply than any other city in the United States.

We are reminded of Pittsburgh as we visit some of Birmingham's enormous steel plants. In one part of the plant are the converters, like gigantic flasks filled with melted iron from the blast furnaces. A great blast of hot air forces its way through the mass, making a flaming, sputtering vol-



Reproduced by permission of the Philadelphia Commercial Museum.

Blast furnace at Birmingham, Alabama. In the foreground is the pig-iron which the furnace has made. This will now be made into steel.

cano, burning all impurities out of the iron in a few minutes, and making it into steel. "That's a regular Fourth of July show; I'd like to see them do it again," remarks Jack.

In another portion of the works are the open-hearth furnaces, where gas flames play over basins of iron. Men with long bars stir this "soup" for hours and try a little from time to time until it is "cooked" to satisfaction and has been made into steel. Open-hearth steel is much better than steel made in converters, though it is also higher in price.

Border Cities.—Now we return to Atlanta and then proceed toward the sea. First we go to Macon, past cotton-fields and many peach-orchards, for Georgia raises more peaches than does any other state except California. Macon's river, the Ocmulgee, gives good water-power for her mills.

Macon may be called a "border city," since it stands upon the Fall Line. Let us follow that line northward for more than a hundred miles until we reach another border city, Augusta, which looks from encircling pine trees upon the Savannah River. Augusta was formerly a border town in another way; it grew up around a border fort, named for the daughter of King George of England. Many a meeting did the white settlers and the Indians have at Fort Augusta.

This city, called by the name of a princess, is also given the title of "The Lowell of the South," for it manufactures more cotton cloth than any other city below Baltimore. The wide Savannah River furnishes power and gives a waterway by which freight is carried to Savannah. Perhaps we could find a little steamer which would take us down, more than two hundred miles, to Savannah, the "Forest City," but as we are pressed for time, we must take the railroad.

Georgia Pines.—The railroad passes through long stretches of pine trees, with needles a foot long. At a station Ruth and Alice buy pretty baskets woven from these needles. These trees are called "long-leaf pines," "yellow pines," or "Georgia Pines." From the train we see many lumber mills which are turning the pines into beams and planks. In other places we see men cutting holes or "boxes" in the trunks, of the trees, near the ground, and then gashing the bark above the holes. "Why do they do that?" Fred asks the conductor.

"These men are collecting the sticky sap, which will flow into these boxes," replies the conductor. "They take the

sap in barrels to a 'still' or distillery, a rough-looking building where the gummy juice is melted over a furnace, and part of it turns into a gas or vapor. This vapor passes through cool pipes and condenses into a clear liquid called turpentine. In the kettle over the furnace is left a yellow remainder called rosin, which hardens.



Tapping for turpentine in the new way. Instead of cutting a basin in the tree, the worker fastens on tin spouts, which lead the sap into clay cups. This method produces more turpentine and saves timber.

"Turpentine dissolves paint, so it is used in great quantities by painters and varnishers. Do you play the violin? If so, you put rosin on your bow to make it take hold; but that is only a small use of this material. Rosin is also put into varnish and is useful in making paper and soap. When you are painting boards at home and your paint grows too thick, you thin it out with turpentine. Roots and branches

of the pine trees are heated in ovens, and from them comes a thick dark liquid called tar. This is especially valuable on shipboard for filling cracks in timbers and protecting rigging from the action of salt water and salt air." What a useful tree the pine is, to be sure.

The Forest City.—Now we have reached Savannah. Fifty years after Philadelphia was founded a shipload of emigrants from England, led by James Edward Oglethorpe, came up the river. About twenty miles from the sea the General saw a high bank extending for a long distance. There the thirty families landed and the city of Savannah was begun.

Oglethorpe's chief engineer, Colonel Bull of Charleston, laid out a long main street with small squares at intervals along it. These squares were to serve as market places and as centres to which the settlers could rally in case of an Indian attack. Today the main street is called Bull Street and the small squares have become parks, each with a central statue surrounded by magnolia and live oak trees, crape myrtle and japonica shrubs. So many beautiful trees line the wide streets of Savannah that it is called "The Forest City." All the children agree that they like Savannah very much.

The citizens of Savannah are proud of the fact that from this "Forest City" port sailed the first steamship, the "Savannah," which crossed the Atlantic. Savannah is now a noteworthy seaport. On its wharves along the river we see thousands of cotton bales, enormous heaps of pine and live oak timber, and a multitude of barrels of tar, turpentine, and rosin.

Stately Charleston.—From Savannah we pass northward or rather northeastward, following the coast line, to stately old Charleston. Our train travels through a lonely region of green sea marsh, cut by broad channels. Charleston is

smaller than Savannah, and we have little trouble in finding our way to the water front.

As we walk along the battery, viewing the water or watching the gray mocking birds hopping about, Fred exclaims. "Why, the name Battery reminds me of New York!" With surprise we notice that the situation of Charleston does resemble that of Manhattan. It is on a peninsula between the Cooper River, which takes the place of the East River, and the Ashley, which answers to the Hudson and from the Battery of Charleston it is about as far to the ocean as New York lies from the sea.

Cotton and Fertilizer.—The harbor of Charleston is not so busy as that of Savannah, but there is considerable commerce. The first bale of cotton which the United States ever sent to Europe was taken from Charleston, in the year after the Revolutionary War ended, and ever since that time Charleston has been a prominent cotton port, its exports being like that of its neighbor Savannah.

After we view the beautiful old homes of the city, or as much of them as we can see through the wrought iron gates of the fragrant gardens with their high walls, we visit a place which is not so beautiful but which is very useful—a fertilizer factory. From the ground in South Carolina and Florida is dug phosphate rock, which is ground up, mixed with nitrate of soda from South America and bones from the same continent, then treated with sulphuric acid made from sulphur which is dug up in Texas; the result is fertilizer which makes food for the fields of cotton, corn, peanuts, and truck. Almost every important southern city has fertilizer factories. "If the fertilizer is as strong as it smells," says Ruth, sneezing, "I'm sure it'll produce fine crops."

We go on board a steamer, which heads for the open sea. Soon an island appears in the harbor. It seems like

an artificial one, for brick walls surround it. This is famous Fort Sumter, against which the first shot of the Civil War was fired, and it is still in condition to make a good defence. As soon as we pass the fort, we feel the lift of the Atlantic waves. "Hurrah, we're off for Florida!" shout the boys.

QUESTIONS AND SUGGESTIONS

1. What New England city is, like Birmingham, named for a city of Old England?
2. For what special uses do you think open-hearth steel is needed?
3. Of what other industry does tapping the pine trees remind you?
4. Describe to your class what happened at Fort Sumter in 1861.

CHAPTER XVIII

NEARING THE TROPIC ZONE

In Florida.—The morning sun shines upon the white sand and white surf of the Florida shore, and our steamer turns westward to enter the St. John's River. For twenty miles or more we go up the stream. When Jack who is on the lookout sees chimneys of fertilizer factories and high piles of lumber we know that we have reached Jacksonville, the chief city of Florida, named after Andrew Jackson, first American governor of the region.

Except for its palm trees and its mild weather in winter, visitors to Jacksonville might find it hard to think they were in the South. Finally we discover an "alligator farm," where hundreds of these scaly monsters are kept, and we feel better satisfied. So many alligators have been killed for their skin and teeth that they are now growing scarce, and it is difficult for visitors to find any in a wild condition.

Let us take an afternoon to drive across the level sandy country to St. Augustine, on a broad sheet of water, the Matanzas River, separated from the Atlantic by a low island. St. Augustine is the oldest town in the United States, and in a hundred ways this quaint settlement reminds us of the ancient days when the Spaniards settled and ruled it. There is the old fort which took nearly a century to build, and Fred discovers the Spanish coat of arms over the entrance. Here is a group of fine hotels built in the Spanish style and bearing Spanish names, one being called the Ponce de Leon, in honor of the discoverer of Florida.

The Silver Spring.—A small steamer is ready to take us farther southward up the wide St. John's. Florida is so flat

the banks of the river are low. In the swamps along the stream stand cypress trees, pale of bark and bulging of trunk, from whose branches hang long gray streamers of that strange "Spanish moss" which is no moss at all. Down the stream float patches of water hyacinth with pretty blue



A drive at New Smyrna, Florida. Here is seen in its greatest abundance the "Spanish moss," which hangs in gray beards from the trees. This air-plant is used to stuff mattresses and to cushion furniture.

flowers, and the captain tells us that farther on this plant would fairly choke up the channel if let alone. On the shore, from the midst of fruit plantations, show the roofs of attractive bungalows.

The peaceful St. John's resembles a succession of lakes more than a stream; we go dreamily, steadily on until it is dark and the searchlight throws its beam over the shores.

After a time our little boat turns into a narrow channel where trees seem to bar the passage. We watch the thick swamp on either side, hoping to see a wildcat or an alligator, until we grow sleepy.

In the morning our vessel is floating in a circular pond. What wonderfully clear blue water! We go out on the water in glass-bottomed boats, and thirty feet below we can see every twig upon the bottom. "This is not a lake," remarks a fellow passenger. "This is Silver Spring—isn't that a good name for it?"

Florida rests upon limestone rock, and as such rock is easily dissolved, it is always full of holes and passages. In limestone regions of other states there are many caves, such as Luray Cave in the Shenandoah Valley of Virginia; but Florida is so low-lying that caves above the water level are absent. She has lakes and springs instead. In northern Florida is the Wakulla Spring, probably the largest in the world, nearly twice as large across as Silver Spring and a hundred feet deep.

Lakes and Orange Groves.—South of Silver Spring we enter a country of lakes, large and small. In all, Florida has thirty thousand such sheets of water. This lake region of central Florida is the great orange-growing section. Oranges will grow well in the northern part, but Jack Frost often bites them. The lakes in this region, however, protect orange trees against an occasional cold snap.

Here we are at the gate of an orange orchard; the owner invites us to sample some of the juicy fruit. "How good it tastes," says Ruth, "I think the best way to enjoy fruit is to have it ripen on the branch." Through the thick glossy green leaves of each tree shine hundreds of golden globes, and the same tree may be sprinkled with fragrant white blossoms. Although an orange grove has to be watched and culti-

vated for five or ten years before bearing, it is then good for fifty years, so that the orange grower has a lifetime income.

The most famous name by which Florida sells oranges is that of "Indian River," which is a channel just back of the eastern coast. Can you find Indian River oranges in your grocery store?

Now we have passed the lake region and are approaching the Gulf of Mexico. Our Seaboard Air Line train brings us to the famous winter resort of Tampa on a great bay of the Gulf. It is a city as large as Augusta and is a famous shipping port for phosphate rock and pine lumber.

One part of Tampa seems like a section of Spain, for the street signs are in Spanish and swarthy-skinned persons are met everywhere. "What's the answer?" inquires Fred. Tobacco is the answer to this Spanish riddle. These brown people are Cuban cigar makers, who find it better to live in Tampa than in their own country. They roll Havana cigars from imported Cuban tobacco, so they should feel perfectly at home. Cigar making, indeed, is the greatest industry of Tampa.

To the south of Tampa we find large orchards of grapefruit, as well as orange groves. It is not very many years since the big yellow grapefruit became popular as the "starter" for a meal, but now every winter sees more of them produced in Florida. The grapefruit and oranges of Florida, put together, equal in quantity the oranges of California.

Everglades and Ever Gay.—If we tried to cross the state from the Gulf at Tampa southeastward to the Atlantic we should soon get into difficulties, for we should find ourselves in the Everglades, an enormous fresh-water marsh, covering an area as large as Connecticut. In the centre of this marsh is Lake Okeechobee (meaning big water), nearly equalling Rhode Island in size, and studded with many islands.

All around the shallow lake was once a thick growth of tall cutting saw-grass, through which a boat could scarcely pass except in the winding water channels. A few hundred Indians, the Seminoles, lived on the islands of the marsh and of the lake, and kept their settlements hidden from view. In cypress dug-out canoes they poled about the secret ways,

earning their living by fishing and hunting.

At last the state of Florida thought that some of this waste land could be turned to good use. Several canals were dug to drain about one-third of the water of Lake Okeechobee into the Atlantic, and a railroad was built to the shore of the lake. On



Seminole Indians in their cypress dug-outs. Why was our government's war with their ancestors so long and costly?

the dark, rich soil which thus has been rescued many settlers are raising fine crops of truck. Northeast of the lake there are numerous fields of prickly pineapples.

East of the wild Everglades is a winter resort which is as different from that marsh as oranges are different from garlic. Palm Beach is the most fashionable place which can be found in the South during two months of the winter. Here the yachts of millionaires lie at anchor on the blue

water, and people of leisure delight to bathe in the warm sea and to drink tea or dance beneath the cocoanut palms.

Two hours' ride southward along the Atlantic brings us to Miami, a new fast-growing city which is a fine winter resort and also a place of industry. The red strawberries and blushing tomatoes which New York and Philadelphia shops display in January probably come from Miami, which is almost out of the reach of frost.

Flagler's Dream.—The man who built the big hotels of St. Augustine and who made Palm Beach and Miami was rich Henry Flagler. After these achievements he thought "there is work yet to do in Florida." He looked at the map and saw a line of islands or "keys" sweeping around the southern end of the state. The last of those keys, and the port of the United States nearest to Cuba and the Panama Canal, was Key West. "I will build a railroad over those keys," said Mr. Flagler.

"Flagler, you need a keeper," cried his friends; but he began the railroad. His men had to live on houseboats, and one tropical storm took seventy lives, but the work went on. After nine years of planning and toiling the road reached Key West, more than one hundred and twenty-five miles away, and trains could run from New York to that point in two days.

This road has been called "The Railroad over the Sea." From key to key stretch the steel or concrete arches, the longest "jump" between islands being seven miles. From the train at Key West, which jumping-off place with its cigar makers, is like a little Tampa, we could go directly on board a ferry steamer and across the Florida Strait to gay Havana. Flagler made his dream come true and brought Cuba nearer to all of us.

QUESTIONS AND SUGGESTIONS

1. Draw the picture of an alligator. What can you tell about the alligator's habits?
2. How do orange trees resemble apple trees?
3. Debate the advantages or disadvantages of living in the Everglades.
4. Two books by James Otis, *Raising the Pearl*, and *The Castaways*, will let you join in interesting adventures on Florida waters. The first book mentioned concerns the west coast, the second concerns the coral reef of the east coast.
5. What have we learned, during our journey about limestone rock?

CHAPTER XIX

FROM MOBILE TO NEW ORLEANS

Mobile and Cypress.—Hundreds of years ago a strange procession approached the Alabama River. There were armor-clad, black-bearded Spaniards, some mounted and some afoot, a drove of pigs, and a long line of burden-bearing captive Indians. At a stockaded native town the white invaders expected to be welcomed and refreshed, but their welcome was a storm of arrows and their refreshment an all-day fight. At last De Soto's men conquered and the town of Mauvila went up in flames, but the Spaniards paid dearly for their victory. Not far from the spot where Indian Mauvila stood is now the city of Mobile. Alabama owns only sixty miles of seacoast, and Mobile is her only port.

The many ships which visit Mobile carry away not only cotton but also much cypress lumber from the swamps of Alabama and Mississippi. A peculiar tree is the cypress; it looks like an evergreen, but drops its leaves in winter and is therefore called the "bald cypress." It likes to stand, like a small boy, with its feet in the water, yet its roots must have air; so when the water rises around its trunk it sends up from its roots sharp pyramids called "knees," through which it drinks in oxygen.

Cypress wood is light but lasting, and it is now used much in building. In the swamps the negro workmen toil to cut down the big trees which we need. Sometimes poisonous "cotton-mouth" moccasin snakes bite the men; often they suffer malaria brought by mosquitoes; but they work on cheerfully enough.

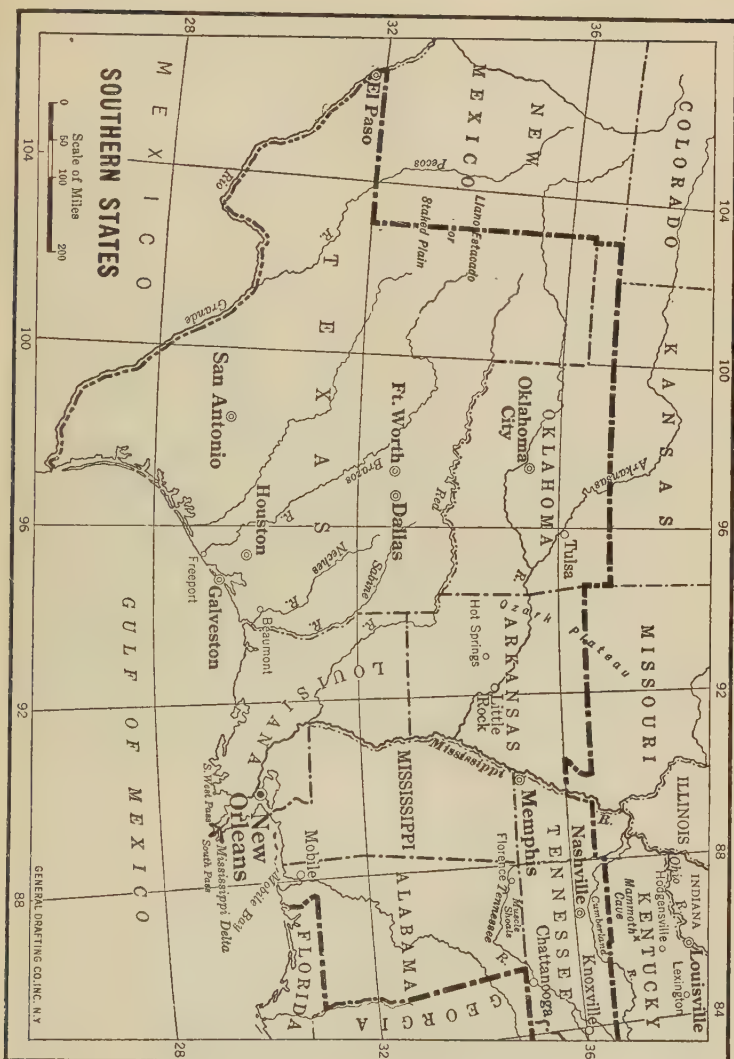
The Mississippi Delta.—By steamer we journey down Mobile Bay, and into the Gulf, and set our course to the south. After a time the boys notice that the blue Gulf water grows muddy, and the first officer of the ship tells them that we are at the mouth of the great Mississippi, the chief river



Cypress on the edge of Lake Drummond, the central lake of the Dismal Swamp Virginia. The "knees" of the pale-barked cypresses rise from the dark water and make traveling through the swamp very difficult.

of North America. Our vessel turns and enters the Mississippi delta.

On the map the officer shows us that near its mouth the Mississippi divides into several branches, so that its waters reach the sea by various channels. This dividing is caused by the dropping of mud which the river is carrying and which falls to the bottom when the river water meets salt water. Thus, the river becomes partly blocked with mud; its waters spread out like a fan and find exits wherever they can.



The fan-shaped or triangular region of soft earth or mud which the Mississippi has built up at its mouth, and is still building, resembles the Greek letter "D", written Δ and pronounced "delta." The region, therefore, is called a delta. Many rivers of the world, flowing through soft earth have built deltas.

Captain Eads Conquers.—Through the Mississippi delta there are two main channels, the South Pass and the Southwest Pass. Our steamer enters the South Pass. On each side of the narrow passage appear large posts or piles, and each one of these is a monument to Captain James Eads.

The mud brought down by the river built up bars in front of each Mississippi mouth, but as long as vessels were small they could pass over these bars. At the time of the Civil War, however, larger vessels were being built, and these vessels could not enter the river. New Orleans' commerce was suffering, when Captain Eads came to the rescue. As a young man the captain had been a clerk on a Mississippi steamboat; he became so interested in the behavior of the river that he studied engineering by himself, and won fame and fortune by his knowledge. Now he said to Congress, "Let me solve the problem of the Mississippi delta."

After much delay, Congress graciously said, "You may try out your plans at your own expense. No success, no pay." Captain Eads felt sure of himself. He set a small army of men to work. They drove posts into the mud and shallow water to a depth of thirty feet. Back of these piles they sunk "mattresses" plaited of willow branches and loaded with stones, and above the first mattress they sunk others, until for miles a solid wall fronted the river.

Being confined in a smaller space, the river current grew swifter and carried the mud far out into the Gulf. The Mississippi thus scoured out its own channel to a depth greater than that which Captain Eads had agreed to make.

Congress paid Eads for his great service at South Pass and engineers improved Southwest Pass according to the skilful captain's plan. "He wasn't afraid to put up his own money on a chance, was he?" says Ruth, approvingly.

The New Orleans Gateway.—A hundred miles above the beginning of the delta we reach New Orleans, the key to the great Mississippi Valley. Thomas Jefferson once looked



Loading cotton bales on an Alabama River boat.

at the map, and said, "I expect New Orleans to be the greatest city in the world." If he had visited the spot, however, he would have found plenty of trade, but poor living conditions. The city lay ten feet below the level of the river, so that whenever it overflowed, New Orleans was flooded. There could be no sewer system, and even the dead had to be placed above ground in brick "ovens." The drinking water was thick with mud and mosquitoes swarmed about. Malaria, yellow fever, and black plague were common.

Today New Orleans has "put her house in order." Powerful pumps take the surplus water from the ground. A modern water system filters the Mississippi liquid into clearness. The city has gotten rid of the plague by getting rid of her rats, and has cleared out malaria and yellow fever by clearing out the breeding places of mosquitoes. There is a fine sewer system. In short, New Orleans is a good place in which to live.

West of Canal street, a crowded avenue of business which once was part of the moat defending the old city, is the ancient part or French quarter of New Orleans. Here we see twisting, narrow streets, paved with rough stones, old houses with iron balconies and inner courtyards, old shops, and foreign-looking signs, all speaking to us of the French and Spanish history of this gateway settlement. Although winter occasionally brings ice and snow, the climate of New Orleans is usually delightful while northern storms are raging. Alice and Ruth say they would like to come each year to enjoy the magnolia blossoms and the roses and to wander through the picturesque "old quarter."

We may call the Mississippi New Orleans' front door, but the city has provided a back door to her mansion. A canal to Lake Pontchartrain, which lies on the north, has brought the Gulf forty miles nearer to the city, and has made an easy passage to Mobile. Iron and coal from Birmingham enter by this new "Industrial Canal" and will make New Orleans a great manufacturing city. Her commerce already is very large. Petroleum from Mexico, coffee and bananas from Central America, and sugar from Cuba enter in great quantities, while grain from the Middle West, and cotton from the South pass out by thousands of steamers. New Orleans is the gateway of our South and our special port for the Spanish countries of America.

QUESTIONS AND SUGGESTIONS

1. What Southern trees, beside the cypress, can you name? Which of them are good for lumber.
2. Find a delta in some stream near your home, and draw a map of it. What caused the delta?
3. How deep would the passes through the Mississippi delta have to be in order to admit the largest steamships to-day?
4. Why is New Orleans not situated directly on the sea?
5. By the scale of a map, find how far in a straight line from the ocean is the Eads Bridge.

CHAPTER XX

SUGAR PLANTATION AND RICE FIELD

The Cane Fields.—Today we are visiting the sugar cane fields. From a distance the green cane looks like its cousin the corn plant; but as we draw near, we see that the cane stalks are thicker and taller than those of corn. The rows of cane, moreover, stand so close together that we cannot walk through the field except by the regular roads.

Here are men cutting the cane. They have big, heavy knives such as are used in some parts of the North for cutting corn. Be careful, Fred, do not get too near! Slash, slash, the blades bite into the thick-growing cane. They are cutting it off close to the ground in order to save all the sweet sap, then they strip off the leaves and the cane is thrown into carts. These carts carry the heavy cane to cars which run on a track through the plantation and which take the cane to the plantation mill.

At the Sugar Mill.—As we follow the car to the mill we suck the juice from one of the joints of cane. How good it tastes! That is the only kind of candy which some plantation children get. Here we are at the mill, just in time to see our cane disappearing between long steel rollers that are thicker than barrels and studded with savage teeth. They crunch the stalks in their powerful jaws, and when the cane comes out it is squeezed dry. In fact, it is ready to go into the furnaces to make steam for moving the rollers.

The pressed out, dirty-looking juice pours down into tanks. "It's sickeningly sweet now," remarks Alice; "I tasted it." The liquid must be bleached and the dirt must

be settled. When this has been done, the juice is boiled and skimmed and boiled and skimmed, growing thicker and thicker, until it is mushy with sugar trying to form into grains or crystals.

Now we see the "mush" put into big cylinders with walls of fine wire. These begin to revolve, faster and faster; as they whirl, the remaining juice, or molasses, is thrown out through the fine meshes, and the crystals of sugar cling



Reproduced by permission of the Philadelphia Museums.
Hauling sugar cane.

in a thick, damp layer to the inside of the cylinders. This sugar is "raw sugar," and we are not yet ready to buy it for our tables. It must be made harder and whiter before we care for it.

The plantation cannot refine its raw sugar any further; the bags must be forwarded to an immense refinery such as we have seen in Philadelphia, with expensive machinery that can handle great quantities of raw sugar. Most of the Louisiana mills send their sugar to New Orleans, which has the largest refinery in the world.

The Sugar Prospect.—Louisiana is the great sugar cane state of the Union, although there are also many sugar plantations along the coast of Texas. “Wouldn’t you expect Florida to be in on that?” questions Jack. Well, they are planning to raise a great deal of sugar cane, but have not gone very far as yet. Elsewhere in the United States the climate is not warm and moist enough. Even in sunny Louisiana, cold rains often hurt the cane fields.

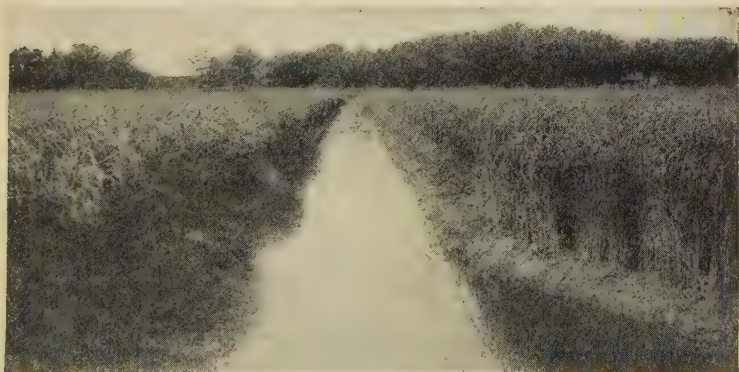
If it were not that we people of the United States have such a sweet tooth that we can hardly get enough sugar, Louisiana cane planters would have a hard time to make ends meet. At our door is Cuba, which does not have frost in its cane fields and produces so much sweetness that it is called “The Sugar Bowl of the World.” Then, too, there are other people in our country who make sugar and can raise their sugar crop in the summer of the Northern States. In fact, at the present time they make several times as much sugar as the Louisiana and Texas planters can produce. “In that case, I invite myself now to visit these other sugar makers,” speaks up Ruth, “for I surely like sugar.”

Grains of the Tropics.—The warm, moist climate which sugar cane loves is bad for most kinds of grain. Wheat, oats, rye, and barley will not flourish, and even the kernels of corn become so soft that they will not keep long. There is one kind of grain, however, which can grow alongside sugar cane and will take the place of wheat for daily food—that grain is rice. It prefers a marshy soil, and its kernels are inclosed in a tough husk that is a regular mackintosh to keep water out.

“Then, I suppose we shan’t have to go far away from the cane fields to find the rice fields,” Fred remarks. Fred is right. Naturally, if Louisiana is the great sugar cane state she might easily be the first rice state in the Union, and

indeed, such is the case. Before the Civil War, however, we should have had to go to the Atlantic Plain to find great rice plantations.

Many, many years ago, a sea captain gave to the governor of Charleston a bag of rice. The governor found that the rice grew well in the marshes, and soon gangs of slaves were raising rice among the snakes and mosquitoes of the South Carolina and Georgia seacoast. Today the rice plan-



A rice field in Louisiana. You see one of the irrigation canals. There is a kind of rice that can be grown on dry ground, but it does not produce so much grain.

tations of those two states have gone to decay, for a new rice region has been put upon the map.

The Rice Prairies.—In Louisiana, and extending into Texas on the west and Arkansas on the north, there stretch great prairies, with flat surface and fertile soil. For many years nothing was raised upon these prairies except cattle, which roamed at will devouring the plentiful grass. Then someone discovered that not far below was a thick layer of sand and gravel, through which flowed a bountiful supply of pure, clear water. People began to think, "Why not use this water to raise rice, which likes to have its feet wet?"

Today more than a million acres of these great prairies are producing that excellent food, rice, the principal diet of half the people on earth. Rice needs much water during its growth. In China and Japan bare-legged workers splash about in the mud, planting the crop; but in Louisiana and Arkansas the dry rice fields are plowed and planted like other fields, many tractors being used. Two or three times before the harvest the fields must be flooded, which is done by pumps bringing water from the depths of the earth.

What do they do at harvest time? Why, that is very simple; the water is allowed to drain off, and the ground becomes dry enough so that regular harvesting machinery can be used. Big threshing machines take the grain out of the sheaves and presto! the bags of rice are filled.

Each year more rice is raised on these prairies, so that not only do the planters produce enough for the United States, but our country is able also to sell large amounts to foreign countries. When the people of California found that the prairie rice was profitable, they began to raise rice on some of their lowlands, and they too are greatly increasing their production. However, when we eat rice, with cane sugar on it, most of us will be eating one if not both of the important Louisiana crops.

QUESTIONS AND SUGGESTIONS

1. Could boys and girls work in the canefields? Explain your answer.
2. In what countries is rice the principal food?
3. On what kind of land would rice be raised in California?

CHAPTER XXI

OUR BIGGEST STATE

Giant of the Union.—We have crossed the Sabine River, the western boundary of Louisiana, and are now in Texas, our largest state. In the days before railroads, a man would ride for weeks in crossing this great expanse of land. Even now, when drawn along by the swift locomotive, those who pass through the state on their way from New Orleans to Los Angeles will spend more than a full day in Texas. In this one division of our Union could be put the six New England States, New York, Pennsylvania, and New Jersey.

We shall find in this giant state an interesting variety of land. Near the coast are the rice prairies, farther back a belt of sandy land overgrown with pines, then a belt of rich black soil where cotton is king, then broken country leading up to a dry plateau, the Staked Plain, in the extreme west; a portion of the Rocky Mountains, and in the southwest, along the Rio Grande, real desert with low shrubs and thorny cactus plants struggling for life in the dry soil. Texas, like New York, is an Empire State.

Oil! Oil!—In a short time after our Southern Pacific train crosses the Sabine River we reach the Neches, which flows into the Sabine. On the bank of the Neches, nearly three hundred miles from New Orleans, is Beaumont, whose name means “beautiful mountain”; but none of us can find any mountains in the flat land surrounding the city. There are heaps of wealth, however, in the rice fields and the pine and cypress forests of which Beaumont is the centre. Above

all, making Beaumont almost forget rice and lumber, is that "flowing gold," petroleum, for here is a rich oil field.

At Beaumont is a forest of derricks so close that a child could throw a stone from one to the other. The oil from these wells is stored in great "farms" of steel tanks until the refineries are ready to use it. From the Beaumont refineries, tank vessels can take the gasoline, kerosene, fuel oil



Galveston's great sea wall. Of what is the wall made? Why is it curved? Why is so much material placed at its foot? Does Atlantic City need such a wall?

and machinery oil down the Neches to the Sabine and out to sea.

The Atlantic City of the Southwest.—An oil vessel takes us along the coast westward to a sandy island on which, like Atlantic City, rests the city of Galveston. This name should really be Galvezton in honor of the Spanish governor of Mexico, who helped the United States during the Revolution. Few ports have grown up under worse conditions than has Galveston. As soon as Texas freed herself from Mexico

there was demand for a port. Large vessels which came to the little settlement on Galveston Island found such a shallow bay that they had to anchor miles from shore and discharge their cargo into small boats. Yet so sorely did Texas need a port that year by year Galveston grew.

At last Uncle Sam came to the rescue, for he saw how Texas was developing and what a favorable point Galveston occupied. His engineers built jetties like those made by Captain Eads at the Mississippi mouth, and dredged a deep channel to the city wharves. Galveston prospered.

Then one September day a hurricane came roaring across the Gulf and swooped upon the city. Great waves washed across the low island, destroyed the buildings, and drowned at least five thousand people. "Galveston is done for," thought many; but the citizens refused to be conquered. They built a sea wall, anchored and protected by great blocks of granite, and against that curved concrete, five miles long, the waves now dash in vain. Then these brave and wise men set to work to raise the whole city twenty feet higher. Without stopping business, this was done. Now it is not likely that Galveston will ever be demolished again, no matter how the Gulf may rage.

Today Galveston has the honor of being the greatest cotton port of the world. She ranks as the third United States port in the value of cargo which is handled. Only New York and New Orleans surpass her. Because of her warm climate and the many seashore resorts nearby, Galveston entertains a host of tourists yearly and has built a score of fine hotels. "She is a combination of Mobile and Atlantic City, a port and a summer playground in one," says Alice.

Houston and the Sulphur Mines.—Our vessel turns northward through Galveston Bay, then westward along a deep canal. Fifty miles of this voyage, and we arrive at Houston

(Hew-ston), one of the proudest Texan cities. The name reminds us of fearless Sam Houston. "Do you know what he did, Jack?" asks Fred. "Certainly I do," answers Jack smartly. "He drove out the Mexicans and became president of Texas, the Lone Star Republic." The battlefield of San Jacinto, where the Mexicans were finally defeated, is near Houston and Houston is one of the greatest inland cotton cities of the United States, and an important railroad centre.

From Houston let's motor across country to the mouth of the Brazos River, at Freeport. Here we see rows of yellow blocks which look somewhat like tall concrete houses painted that cheerful color. "But they have no doors or windows; what are they?" asks Ruth. These solid masses are immense blocks of sulphur, for here and on the Louisiana coast are two of the greatest sulphur mines of the world.

Sulphur is a wonderfully useful mineral. Scarcely any industry could get along without sulphuric acid made from sulphur. In bleaching paper, in refining sugar and petroleum, in making fertilizer and explosives, sulphur is necessary. Down in the ground, more than five hundred feet below us, are the layers of sulphur.

"Is it mined by tunnels such as we walked along in the coal mine?" questions Alice. "No, people have discovered a new way," replies the engineer. "Sulphur melts easily, so we drove pipes down into it, poured a stream of boiling water down some of them, and then forced the melted sulphur up by means of compressed air pumped down other pipes. Wasn't that pretty clever? When the sulphur rises to the surface it pours out into an immense mold of planks where it hardens and forms blocks like those which we saw. Instead of buying sulphur from the craters of volcanoes in foreign countries, the United States is thus able to supply her own needs."

San Antonio.—Now we ride about two hundred miles toward the setting sun, past many cotton fields, to San Antonio, the most important city of western Texas. San Antonio lies on the line between the Gulf Plains and the broken country which leads up to the High Plains or Great Plains. It is the chief market for the cattle, horses and



The Alamo in San Antonio. This has been called "the Thermopylae of America." Look up the story of Leonidas and his Spartans at Thermopylae and see if it reminds you of the Alamo.

mules raised on the High Plains, and for the cotton and corn raised on the Gulf Plains.

We spend a pleasant day in San Antonio, whose name reminds us of its Spanish beginnings. First we motor out to see the old buildings of the "missions," where the Franciscan Brothers labored to convert and civilize the Indians. Returning to the city, we stroll to the famous Alamo, once a mission also, built in a grove of "alamos" or cottonwood

trees. Here less than two hundred Texans, captained by James Bowie and David Crockett, defended themselves, until overwhelmed by the Mexican thousands. "Remember the Alamo!" ran the cry along the American ranks at San Jacinto—and Texas became free.

El Paso.—We may take a trip southward from San Antonio to look at the most southern boundary, the Rio Grande. This Spanish name means Great River, and the stream is great in length, but not in strength. Down from the mountains, through New Mexico, it comes with a rapid current, but much water is drawn from it on the way to irrigate little farms and gardens.

Finally an enormous dam, that of Elephant Butte (pronounced Bewt), catches its waters. A hundred miles below this dam is El Paso, "the Pass," where the Rio Grande comes through the Rocky Mountain ridges at the extreme west of Texas. El Paso is one of our chief gateways into Mexico, for the railroad crosses the river here at the entrance of the mountain gorge. Many Mexicans work and live within the city limits. High up above sea-level, with mountain peaks rising about it, El Paso has a delightfully mild climate. One of El Paso's sayings is: "Our homes are built to let the out-doors in."

The Elephant Butte dam, which makes the biggest artificial lake in the world, and enriches the Rio Grande Valley for one hundred and seventy-five miles, furnishes abundant water for growing fruits and vegetables around the city, and El Paso boasts that "green stuff" is grown there every month in the year. From the mountain mines come to El Paso trainloads of copper, silver and lead ore, from which the metal must be taken. From the hot, dry, half-desert country below El Paso, outside the irrigation district, come trainloads of cattle, of sheep and wool, and of long goat hair, for sheep will live where cattle will starve, and goats

will live where sheep would die. El Paso is such a centre of trade that it has grown to be larger than Troy, in New York, or Harrisburg, in Pennsylvania.

The "Great River".—Although the Rio Grande is a boundary between two large countries it is not a good "international" boundary. Though it flows for eight hundred miles below El Paso before it reaches the Gulf, the hot sun, the dry air, and the irrigation, take out much of its water. Its bed may be a mile wide, but during most of the year it is hard to find the river among the wide stretches of sand and scrubby willows. In general, men can easily ride their horses through the "Great River." At one time Mexican bandits often dashed across, attacked ranches or even towns on the American side and dashed back again before the "Texas Rangers" or the startled citizens could get at them.

The river also has a provoking way of suddenly changing its course in flood time, as it cuts through the soft soil. A Texan may wake up some morning and find that the Rio Grande has put his home into Mexico during the night. To compensate for that bad feature, however, the river near its mouth allows people to water the sandy soil and raise great winter crops of onions and tomatoes.

QUESTIONS AND SUGGESTIONS

1. How large is Texas compared with your home state?
2. Why were the citizens of Galveston both brave and wise?
3. What is a butte? Find the definition in your dictionary.
4. In *Flowing Gold*, by Rex Beach, chapters Four and Five will tell you how Allie and Buddy Briskow acted when their father struck oil in Texas.
5. *The Lone Star*, by Eugene P. Lyle, Jr., will take you back to the exciting days of Houston, Crockett, and Bowie in Texas.
6. MAKE a sketch showing how pipe lines come into Port Arthur from various oil regions.

CHAPTER XXII

SISTER STATES

The Staked Plain.—Our sturdy motor car climbs by degrees from San Antonio to the High Plains, which in Texas are called the Llano Estacádo, or, translating the Spanish words, the Staked Plain. It is said that the pioneer travelers across these treeless levels marked the trail by white buffalo skulls stuck upon stakes.

The Staked Plain is treeless because it is very dry. About one-third as much rain falls during the year as New York and Pennsylvania receive. "Look!" exclaims Alice, "there is no sod on the ground." Although grass grows it stands in bunches, with the parched soil showing between one bunch and another. This "bunch grass" looks brown and useless during most of the year, but it is really fairly good food for cattle.

Range and Farm.—As the bunch grass grows so thinly, acres and acres of land are required to feed one animal; so the "ranges" are large. Many thousands of acres are included within the wire fences of one ranch. Years ago the thin, tough, half-wild cattle which roamed the range, and were descended from Spanish stock, looked as if their bodies were too small to support their enormous horns. They wandered about all winter, exposed to icy winds and chilling storms, and suffering for lack of food.

Now the "Texas longhorns" have disappeared. In their places are heavy, satisfied looking animals that receive good care through the winter. The cattle ranches manage, by bringing water from a stream or pumping it up by a wind-mill, to raise a fast-growing clover, alfalfa; and the cattle

eat plentiful rations of alfalfa hay until the cold months have passed.

Although cattle raising means much to the Staked Plains, our friends tell us that there are really more cattle on the farms of east Texas than on the ranches of west Texas. Farms and ranches together make Texas the greatest cattle state in our country. Many thousand cattle are sent each year to Fort Worth, in northern Texas, to be slaughtered in the large packing plants there.

The Camel Grains.—

The map shows us that Texas has a squarish portion extending northward. This is called the Panhandle, and it gets just a little more rain than the Staked Plain, so that in it farms are gradually taking the place of cattle ranches. "What can be raised in this dry part of the state?" asks Jack.

Two crops, wheat and Kafir corn, both of them resembling camels, in that they can go a long time without water.

Over there now, boys, is a field of Kafir corn. "Why," Fred cries, "it doesn't look like corn to me." Well, Kafir corn isn't ordinary corn at all—it is a grain of the kinds known as the "sorghums." Such grains have no ears, but the round black seeds grow in bunches at the top of the stalks.



A field of Kafir in Kansas. Is this "camel among grains" suited better to the eastern or to the western half of Kansas? Why?

Corn needs considerable rain, but Kafir corn and some of its brother sorghums can flourish on a little moisture, then peacefully stop growing and rest until the next supply of water arrives. It will stay green when corn has completely dried up.

The name "Kafir" comes from southern Africa and means a certain race of natives. Northwestern Texas, western Oklahoma and western Kansas resemble southern Africa in being very dry, and here Kafir corn finds its best home and is used as feed for horses and cattle. It must be threshed out and then ground. In threshing, the grain gives off a dust which irritates the whole body. Therefore, the Western farmers plant Kafir corn only when they feel that corn or barley will not grow.

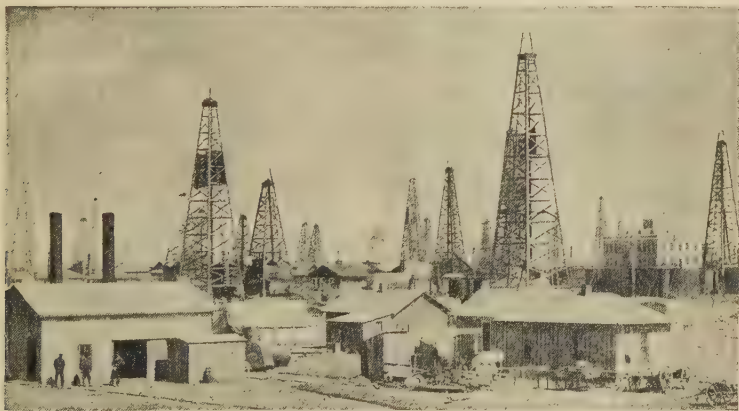
Land of the Red Man.—Texas and Oklahoma are sister states, even though the big sister is four times as large as the little one. They are "cut off the same piece of cloth," and their pattern is the same. Both have the high plains in the west, suitable for cattle raising, the rolling country farther east suitable for general farming, and flatter country still farther east, which is excellent cotton land. Both states possess a wealth of oil and of coal.

Oklahoma is one of our newest states. Its name means "land of the red men," and the title is well deserved. In President Jackson's time most of the Southern Indians east of the Mississippi, such as the Creeks, the Cherokees, and the Seminoles, were moved to these lands, which were given to them as Indian Territory. Later on, our government put other Indian tribes into the Territory.

As the West became settled, the white men saw that a great part of this land lay empty, and they asked permission to buy it. At last the consent of Congress was given. One day in 1889 many thousands of people gathered at the border line, waiting for a signal. At the firing of a gun they

rushed into the "promised land" and hastily drove their stakes marking the best lots for ownership. Soon hundreds of thousands of settlers lived in the broad new territory of Oklahoma.

The old part of Indian Territory, lying east of Oklahoma, was richer than the part which the whites had just settled. Though the "tame" Indian tribes from across the Mississippi



In the Tulsa oil field, Oklahoma. Notice how thickly the derricks stand, each derrick indicating an oil well. The wagons in the foreground have been hauling iron pipes for the wells.

were fairly civilized and governed themselves well, they did not care to farm the land. "Please let us settle Indian Territory too," begged the white men; so at last, only eight years after the first great land rush, the territory of Oklahoma and Indian Territory came together into the new state of Oklahoma. Each "tame Indian" was allowed to keep as much land as any white man could "take up," for the Indians were now considered citizens of the United States.

A Thriving Youngster.—This baby state of Oklahoma is a healthy, thriving youngster. Traveling north from Fort Worth or Dallas, we cross the Red River and find ourselves

on Oklahoma soil. The state capital, Oklahoma City, is directly in our path, and has grown by reason of cattle, wheat, corn and cotton, just as Fort Worth and Dallas have flourished. After looking at Oklahoma City's meat packing establishments, flour mills and cotton presses, not forgetting its State University, at Norman, nearby, we are ready to pass northeastward more than a hundred miles to Tulsa, the next largest city of the state.

Tulsa stands on the bank of the Arkansas river, chief waterway of Oklahoma. It would be a busy city in any event, but as around it centres a great oil field, Tulsa is active indeed. Oklahoma, California and Texas are the Big Three of oil production. What fortunes have flowed out of the ground with the dark, greasy petroleum! Some of this Oklahoma oil, as we have seen, is piped even to the Atlantic Coast. Many of the Indians have become wealthy with the money which has come from oil discovered on their land.

So new to the older states does Oklahoma seem that people do not always appreciate how fast she is coming forward. A state which rivals Pennsylvania in cattle, Alabama in cotton, Illinois in wheat and California in oil is rich in resources. The "land of the red man" has become a land of opportunity for the white man.

QUESTIONS AND SUGGESTIONS

1. Name five great cattle states beside Texas.
2. What is the use of the "sweet sorghums" raised in the South?
3. Do most states have state universities? Prove your answer.
4. In what ways is Oklahoma a land of opportunity?
5. Sketch a map of Texas and Oklahoma together, showing the various regions of their surface.

CHAPTER XXIII

ON THE ARKANSAS AND THE MISSISSIPPI

The Ozarks.—A short ride eastward from Tulsa, the prairies give place to “tumbled waves of upland” called the Ozarks, partly in Arkansas and partly in Missouri. Woodland covers many of the Ozark hills and glens, and small herds of cattle feed on the beautiful slopes. In spring the pure, bracing air is filled with the fragrance of apple blossoms. The orchard owners prefer to plant their trees on hillsides so that the frosty air of spring nights may flow down into the valleys and leave the tender apple buds untouched. This is called frost drainage.

Among the Ozark hills nestle many log cabins, where people pass a simple, contented existence. Arkansas is yet a state where country life is the usual life. What a contrast to a manufacturing state like Massachusetts, with its thickly dotted cities! Lumber is one of the chief Arkansas products, and any region which is very important for lumber is never densely settled.

The River and the Rock.—From Oklahoma, through the southern part of the Ozarks, the Arkansas River traces its path. A friend at Fort Smith, the lumber market on that river, says: “This Arkansas is a great stream. Except the Missouri River, the Arkansas is the longest branch of the Mississippi. For two thousand miles you may follow it to its sources in the Rockies. Small steamboats can ascend on the Arkansas, through Arkansas itself, on through Oklahoma, all the way to Wichita, Kansas. You would need a little spare time to make that journey! Yes, the Arkansas is a great stream.”

Where the river leaves the Ozarks, and comes out into the lowlands, there is a cliff on one side of the stream known as Big Rock. Three miles below, on the other bank, a lower peninsula of limestone juts out, and this peninsula is called Little Rock. Here a city of the same name has been raised and is now the capital of the state.

From her rock, Little Rock looks southeastward along



The city of Hot Springs, Arkansas. In the foreground is the Casino, and to the right you can see some of the large hotels. Of what are hot springs a sign?

the Arkansas toward plantations of cotton. She looks eastward to rice fields where pumps draw water from the river and irrigate the green blades. She looks northeastward to swampy lands where cypress and gum trees afford a plentiful harvest for the lumbermen. No doubt she gazes with great satisfaction.

Our Smallest National Park.—We have seen cotton and rice and lumber operations in other states, so for variety let's

make a little expedition across the rolling hills southwestward to Hot Springs.

Now we have arrived at Hot Springs. "They tried to hide this place away in a valley just on the edge of the Ozarks," said a writer, "but it steamed so it could not be hid." Many springs of warm or of hot water break out at the bottom of hills which shut in Hot Springs. On our way we stop at a settlement whose station bears the queer name of Bauxite. "What does that mean?" asks Alice. "Look at those cars of rock, and I'll tell you," replies the station agent. "That stuff is bauxite, and bauxite is used to make aluminum." Arkansas produces almost all the bauxite in the whole United States.

"Oh, does this rock go all the way to Niagara Falls, where we saw them making aluminum?" continues Alice. "I don't know about that, but I do know that a lot of it is taken to East St. Louis," answers the agent.

So healing are the mineral waters of the hot springs that our government made first a reservation and then a national park about them. Here is an immense hospital where Uncle Sam takes care of all his sick servants from the army and navy who may be helped by these "thermal waters."

This park is the oldest of the national parks. Though it is also the smallest, many thousands of visitors come each year to the hotels which adjoin the reservation. They drink the water, enjoy the baths, and ascend the mountain observatory from which four states can be seen.

The Father of Waters.—Back again at Little Rock, we take a steamer down the Arkansas. Our boat reaches the river mouth and turns upward against the strong current of the Mississippi. This stream, "The Father of Waters," brings down a flood of water which seems like liquid mud. A glass of water, allowed to stand, will soon have at least

a quarter-inch of mud at the bottom. Ruth and Alice declare that they can feel the mud on their tongues as they drink.

The lower course of the Mississippi is all in soft ground which the river itself has brought down. Through this soft soil the Mississippi winds in great curves; every now and then it carves itself a fresh channel. In the course of many centuries the great river actually built up its bed until



On the Mississippi near Dubuque, Iowa. Notice the gangplank extending from the bow of the steamer. In the background is a bluff. What do you see in the foreground? Why do railroads seek river valleys?

it was higher than the surrounding land. Whenever floods came, it overflowed the country until for ten or twenty miles on each side there was a vast lake. Animals were drowned, and families took refuge in the second stories of their houses until the flood went down.

Between the Levees.—Today the Mississippi is held in check by artificial banks or levees, thick at the bottom and wide enough for a roadway at the top. Fifteen hundred

miles of these levees line the river and hold it to a width of no more than two miles in any place. The states which border the Mississippi pay part of the cost and Uncle Sam attends to the rest.

When flood warnings come from the observers of the United States Weather Bureau, guards patrol the levees. They watch to see that there are no leaks which might weaken these walls. If the water rises to a dangerous height, the guards call up workers who pile up sand bags on the levee to keep back the flood or build plank walls for the same purpose. "You shall not pass," say they to the river.

As the boat pushes its way slowly up stream, we see government boats dredging the channel or pulling out sunken trees which might pierce the hull of some vessel. "Uncle Sam tries to keep the river in good condition," says the steamer captain, "but the steamboat commerce on the Mississippi does not amount to much. The railroads have taken away the trade from the steamboats. Carrying freight by water, however, is cheaper than carrying it by land, so I am sorry to see this fine river used so little."

QUESTIONS AND SUGGESTIONS

1. In what part of our country are most of the national parks? Why?
2. Read in your daily paper the weather prediction sent out for to-day by our national Weather Bureau. Did it come true? How does the Weather Bureau help the people of this country?
3. In what three ways has our government improved the Mississippi?
4. Describe what would happen if the levee guards grew careless.
5. In *Happy Hollow Farm*, by William R. Lighton, read how a real home was made in the Ozarks.

CHAPTER XXIV

ON THREE GREAT RIVERS

On the American Nile.—Our steamer now passes the line between Mississippi and Tennessee, and approaches a low “bluff” or small hill, which seems to us higher than it is, because we have seen so much flat country. This bluff marks the spot where De Soto first looked upon the mighty river in which his fever-stricken body was later buried. On the flat top of the bluff, out of reach of the yearly floods, stands Memphis, largest city of Tennessee.

“Isn’t that a strange name,” remarks Fred. “Tell us why it was called that.” The name of Memphis comes from Egypt, where an ancient city so called watched the flow of the Nile; and it is a good title for this great cotton market city of the New World, looking down upon the yellow Mississippi which is often called the “American Nile.” Large vessels can come up the river as far as Memphis, but there they must stop, and light steamers, drawing only a few feet of water must carry the cargoes on the upper stream.

The hundreds of thousands of cotton bales which come into Memphis from the surrounding country will be sent long distances by rail and water. Although they have been pressed once, they go again into the powerful Memphis presses, like those of Galveston, and we watch the bales getting squeezed into half their former size. Plenty of lumber comes into Memphis, too, not the pine of the sandy lands, not the cypress of the swamps, but hardwoods, such as hickory, ash, and walnut, which are very strong and tough.

The Ohio.—As the steamer moves upward from the wharf, we see that we are passing under two bridges, the first to span the river in the many miles between Memphis and New Orleans. We have come to the “upper river,” which has higher banks and a shallower bed. On the west shore Arkansas gives place to Missouri, and on the east



A levee being built at Cairo, Illinois. How is this levee different from those along the Mississippi? Find Cairo on the map and tell why it needs a high levee.

Kentucky appears instead of Tennessee. We come at last to a strong river a mile wide flowing in from the east; it is the Ohio.

Alice observes that the meeting waters of the two giant rivers seem to dislike each other. As they are of different color—the Ohio a light yellow and the Mississippi a dark brown, it can be seen that they do not easily unite. We

notice some ferryboats taking freight cars across the "Father of Waters," and see the fleets of coal barges coming down the Ohio. Fred and Jack remember that at Pittsburgh a lot of barges were waiting for high water to help them down stream. Not far above Cairo two large streams, only a few miles apart, add to the Ohio waters. These are the Tennessee and the Cumberland. Our steamer leaves us at the mouth of the Tennessee.

To Muscle Shoals.—Another steamboat puffs into sight, coming from St. Louis. All aboard, for up the Tennessee we're going. The first part of our trip is through Kentucky. At the landings are piled great hogsheads of dark tobacco leaves, for tobacco means even more to Kentucky than it does to North Carolina, and the western part of Kentucky is the greatest tobacco region of the state. "I can smell that tobacco right through the barrels," says Ruth.

Directly south across Tennessee we travel, almost parallel to the Mississippi; then the river curves into Alabama, and we reach famous Muscle Shoals, more than two hundred and fifty miles from the beginning of our present voyage. Here the Tennessee dashes for a long distance over rocks, in small falls and roaring rapids.

During the Great War our Government planned to use the great force of the river for developing power and for making explosives from the "nitrogen" gas contained in common air. The immense Wilson Dam was begun, and nitrate works were laid out at vast expense, just above the town of Florence, Alabama. At the end of the war Congress felt that the new works were too expensive to be finished by the government; but some day more power may be produced at Muscle Shoals than at Niagara Falls.

Into the Mountains.—After passing through the canal and locks at the shoals, our boat resumes its journey through the fertile lands of Alabama. At the northeastern corner

of the state we enter Tennessee again. What an enormous bend the river makes! In Indian language, "Tennessee" means "Big Bend," and the snaky course of the river doubtless was the cause of the name.

A long mountain ridge, Lookout Mountain, gazes down upon our steamer. If we stood on the northern end of that ridge, nearly a third of a mile above the deck of the boat, we should see the river making a sharp curve which leaves a peninsula like an Indian moccasin. This is accordingly called Moccasin Bend, and it almost enfolds the growing manufacturing city of Chattanooga.

Chattanooga marks one end of a passageway through the Appalachians from the Tennessee River Valley to Atlanta. Consequently it was at Chattanooga that General Sherman began his famous march to the sea. Farther up the Tennessee, in a region of great beauty, surrounded by mountain ridges, is Knoxville, famous for its quarries of pink marble. We have come back on our path so that we are not far from familiar scenes. The rapid French Broad River, which flows into the Tennessee near Knoxville, would lead us back to Asheville, and from the mountain ridges overlooking the Tennessee it may be possible to see Mount Mitchell. "Can't we get an airplane and fly back there?" anxiously questions Jack.

Knoxville and Chattanooga lie in the Great Valley which leads down from Virginia. Here it is thirty, forty or fifty miles across, fertile and beautiful, good for farming and for raising livestock. On the west rises the steep wall of the Cumberland Plateau, which is the same as the Allegheny Plateau of the northern states.

The Nashville Basin.—Would you like the fun of a horseback ride? "I'm sure I would!" says everyone. We take our good steeds and climb the Cumberland wall. After that we travel gradually down among the forest-clothed

hills of the plateau until we reach a sort of basin of limestone which occupies the central part of Tennessee. We have seen, you remember, that as limestone rock decays it leaves a very rich soil. Through this rich basin flows the Cumberland River, on whose bank is Nashville, capital of the state.

Nashville was founded after the Revolution, by two of the most heroic pioneers in our history. The governor of Tennessee himself tells us thrilling stories about James Robertson and John Donaldson, and our hearts swell with pride that our country had such men to lay the foundations of new states. While we feel so enthusiastic we visit Andrew Jackson's home, the Hermitage, only a few miles from Nashville, and look upon the relics of that stout fighter and stout patriot.

At Nashville we could board another steamer, and pass down the five hundred miles of water path on the Cumberland, back almost to the doors of Paducah, from which we started on our trip up the Tennessee. No doubt the steamer would be loaded with barrels of flour, for the Nashville Basin is a wonderful place for raising wheat to supply the Nashville mills. However, we shall soon visit even a greater wheat region than this, and as we have already passed through the tobacco fields of western Kentucky, we decide to travel northward by land.

QUESTIONS AND SUGGESTIONS

1. In an encyclopedia or geography text-book find an account of the Nile River. How does the Mississippi resemble the Nile?
2. Sketch a map of the Tennessee and Cumberland rivers, showing how close together their courses run.
3. What benefits can come from nitrate works in time of peace?
4. Report to your class on the thrilling story of the long voyage of John Robertson and his party to settle Nashville.

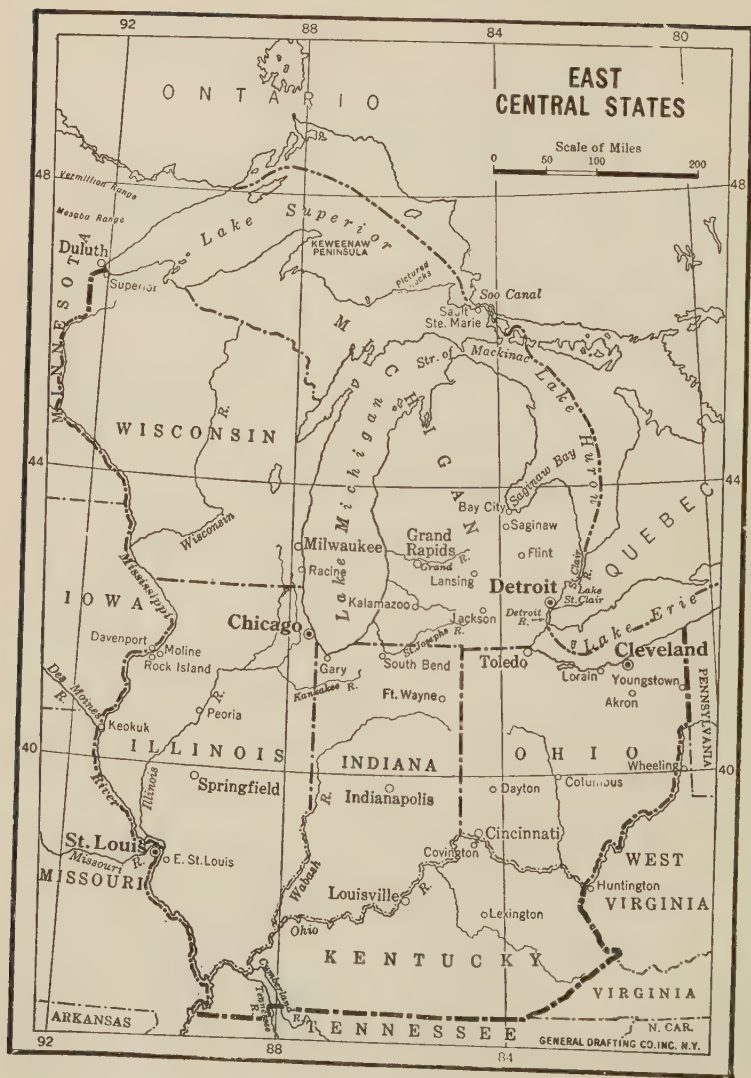
CHAPTER XXV

THROUGH KENTUCKY AND UP THE OHIO

Mammoth Cave.—A trip of a few hours by automobile through the pleasant country brings us to a high rocky doorway in the heart of a Kentucky forest. This is the entrance to Mammoth Cave, the largest cave in the United States. Most limestone regions have many caves, made by the water dissolving the lime and forming underground passages. Tennessee and Kentucky are partly made of great beds of limestone, and wise men have estimated that there are a hundred thousand miles of caves of good size beneath the surface.

The hunter who discovered the Mammoth Cave by chasing a wounded bear into it was afraid to explore far into its many windings, and even yet they are not completely traced out; but visitors have a chance to walk for twenty miles through avenues and chambers fringed with "icicles" of stone, called *sta-lac-tites*. Some of the chambers are "domes" which arch hundreds of feet over our heads. As our guide sets off fireworks in the Star Chamber, a multitude of little points of light, like stars, gleam from the points of the stalactites hanging far above; and Alice and Ruth clap their hands, calling out, "Oh, isn't that too pretty for anything!"

We squeeze through the narrow passage called Fat Man's Misery, ride in boats for nearly a mile on dark Echo River, which flows through the cave, and cross another stream on a natural bridge. As we come out of the cavern, the guide shows us specimens of the eyeless fish which inhabit



the underground river. "People say that Luray Cave in the great valley of Virginia is more beautiful than the Mammoth Cave," observes the conductor, "but I know it is not so wonderful." We agree with him, and turn to the nearby hotel, tired but satisfied.

Lincoln, Clark, and King Louis.—Next day we drive northeastward toward Louisville, but on the way we feel that we must stop at the little town of Hodgenville, where, on a little Kentucky farm, in a poor log cabin, was born one of our greatest national heroes, Abraham Lincoln. What difficulties he overcame, what success he gained, what service he rendered to our country, we all know. The cabin birth-place is preserved, to show that America is the land of opportunity, but it is covered and protected by a memorial building which tells of our love for our martyred President.

Near the end of the day we spy the Ohio flowing before us, and here spreads out also the city of Louisville, Kentucky's queen city. One day, drifting down the Ohio, came George Rogers Clark, on his way to take the British forts in the "Northwest Country." At this point dangerous rapids, the Falls of the Ohio, stopped his flatboats. Seeing that this was an important spot because cargoes would have to be unloaded here, Clark built a fort to protect it, and around the fort some pioneer families, who had come with him, put up their homes. While the work was going on there came the glad news that King Louis of France had decided to help the American cause, so the tiny settlement was called Louisville.

Now Louisville has grown to be a city about as large as Providence. Kentucky is the greatest tobacco state of the Union, Louisville is the greatest tobacco market. Every year many tobacco buyers come to the "Falls City" to purchase not only for American firms, but also for European countries. Around the Falls of the Ohio there is now a

canal, and a dam spreads and checks the waters of the river for fifty miles upstream. From Louisville thirty-three navigable rivers can be reached. So the city is a very important steamboat centre.

The Blue Grass Basin.—Driving eastward from Louisville, we come to the famous Blue Grass Region, a limestone



Lexington, Kentucky, on Court Day. Of what famous district is Lexington the centre? Before the automobile became popular, what would the men in this picture probably discuss? The foreground will tell you.

plain like the Nashville Basin. The grass which makes its fruitful pastures shows at seed time a bluish green color, and from this fact comes the peculiar name. The planters

who owned these fertile fields once raised thousands upon thousands of fine horses which were prized for driving or racing. A "Kentucky thoroughbred" was a horse of great price. Now the automobile has greatly lessened the demand for the horses of the blue-grass, and these green acres are set to raising wheat, corn, or tobacco.

The central city of the Blue Grass Basin is Lexington, whose people are proud of their reputation for comfortable living and hospitable entertainment. On a day in 1775 some hunters, among whom was Simon Kenton, friend and helper of Daniel Boone, camped at the spot. They liked it, and put up a cabin to mark their claim to the land; as they had just heard of the fight at Lexington, Massachusetts, they called the location Lexington.

Through the heart of the Blue Grass country flows the Kentucky River, which we follow along its downward course to the Ohio. Upstream is the large city of Covington, which would seem much more important if it were not overshadowed by its big Ohio neighbor, Cincinnati, with which it is connected by several bridges. Just as many thousands of persons work in New York and live in Brooklyn, so thousands work in Cincinnati and live in Covington.

Cincinnati.—The country along the Ohio from this point eastward, now begins to rise toward the Allegheny Plateau. Cincinnati is built on shelf after shelf of hills, on whose tops are wooded parks. In one of these parks we see the fine Art Museum with its art school, and from another height looks down the Rookwood Pottery, famous among the lovers of beautiful things.

Once Cincinnati was the greatest meat packing city of the United States, and so many pigs were killed there that it was jokingly called "Porkopolis." Meat packing is still

an important industry, but now Cincinnati's air is growing smoky, like that of Pittsburgh, with the dark clouds from the chimneys of furnaces and foundries.



Art Museum (at left) and the Art Academy, Cincinnati. What situation would you choose for an art museum? Why? If there is an art museum where you live, make a list of the pictures that you especially like.

Voyaging to Pittsburgh.—Another steamboat is at our service to transport us to the end of our Ohio River voyage. Hundreds and hundreds of miles we travel, until on the right bank Kentucky disappears and West Virginia takes its place. For some time we have wondered at the long trains of coal cars passing along that side of the stream. We learn that it is the Chesapeake and Ohio Railroad which is thus carrying the “black diamonds” to market. On the shore appears the city of Huntington where the Chesapeake and Ohio, coming through the great coal fields of West Virginia from the waters of the Chesapeake, reaches the waters of the Ohio. Here also we see the Baltimore and Ohio Railroad, which has been following the river downward from Pittsburgh.

Would you like to hear another story about a name? The name of Huntington comes from that of Collis Huntington, great railroad builder, who began business as a boy of fifteen, peddling the clocks and watches of his birth state, Connecticut. Quick to seize opportunity, he went to California when gold was discovered, supplied the miners with their picks, shovels, and wheelbarrows, and built up a fortune.

Again Huntington saw opportunity, this time in the railroads which our rapidly growing country needed. He and his friends helped to build the iron tracks which united California with the Eastern States, and Huntington became a railroad king. The Southern Pacific and the Chesapeake and Ohio were his children, serving the country and bringing him vast fortune. Many worthy institutions profited by his wealth.

At Wheeling, the oldest city along the Ohio, we once more enter the "Pittsburgh district," where coal and iron reign supreme. It is ninety miles by river before we reach the junction where once stood Fort Pitt, but thick along that stretch are blast furnaces, pipe foundries, rolling mills, smoke and slag. At night the blazing furnaces seem like volcanoes, with red hot lava where slag is dumped on the river banks. On the right is West Virginia's long Panhandle, more like a handle than the "Panhandle" of Texas; on the left are the Ohio hills. At last we end our journey at the sky-scraping chimneys of our old friend Pittsburgh.

QUESTIONS AND SUGGESTIONS

1. Read the account in *Tom Sawyer* of Tom's adventure in the cave near his home. Tell your class about it.
2. What memorial buildings to honor great men have we already met in our travels?
3. What cities can you find on the map whose names remind you of New England cities or towns?
4. Which cities through which we have traveled are named after celebrated men?

CHAPTER XXVI

HIVES OF INDUSTRY

Steel and Rubber.—Now we set out on a journey which will lead us through many centres of manufacturing. The “Pittsburgh District,” whose kings are iron and steel, spreads far out from Pittsburgh. It is founded on the union of coal and iron, but it stays near the coal fields and draws to itself the iron ore.

A short trip from Pittsburgh by the Baltimore and Ohio Railroad brings us to Youngstown, the great steel city of Ohio. Near it is its sister and fellow worker, Canton, the home of President McKinley. Not far away we find Akron, the world’s greatest rubber city. There is no special reason why the rubber industry developed so much in Akron, except that people of enterprise and activity began it and carried it on successfully.

Akron should have a monument to Charles Goodyear, who taught the world how to make use of rubber. What should we do now if rubber should fail? How would you like to get along without rubber overshoes and rubber boots, rubber erasers and rubber bands, rubber fountain pens and rubber balls? “I certainly wouldn’t like that at all,” speaks up Fred. The dentists, the electricians, the nurses, the housewives, would be at a loss without rubber. And how, oh how, would you like to ride on bicycles or in automobiles without pneumatic rubber tires?

In Akron there are numerous rubber factories. We visit the largest, which employs about thirty thousand men. Here is the raw or crude rubber, some of it in great balls or

“hams” from South America, but more of it in crinkly sheets from the plantations in Asia, where the rubber trees are cultivated like apple trees in an orchard. Here are heaps of sulphur from Texas, used in preparing the rubber for manufacturing. Here are thousands of yards of strong cotton cloth which is coated or soaked with rubber in order to make tire fabric. Millions of tires for bicycles, motor cycles, airplanes and automobiles are produced in Akron every year; indeed, it makes well on toward half the rubber tires that the people of the United States ride on. “Let’s call it the Tire City,” speaks up Alice.

Cleveland City.—Our train, speeding north, soon arrives in Cleveland, on the shore of Lake Erie. Cleveland is at a discharging point, where iron ore goes from steamer to car and coal goes from car to ship, while oil travels from pipe line to refinery, then from refinery to both ship and car. The city takes toll from all these materials. Beside her oil refineries, she has many immense iron and steel works, and she uses much coal to run them.

Cleveland’s advantages in being so centrally placed have made her the fifth city of the United States in size, larger than Boston. Moses Cleaveland, founder of the town, wrote before Washington died, “I believe the child is now born that may live to see this place as large as old Windham” (in Connecticut). Today, Moses would be greatly surprised, since for every person who lives in Windham there are sixty now in Cleveland.

Of course we take a walk through the city. We leave on one side the smoky “flats,” where mills and factories are packed close together, and seek the high ground where stands the statue of Oliver Perry, whose battle on Lake Erie was told in those famous words, “We have met the enemy and

they are ours." From a nearby corner begins the best known street of the city, Euclid Avenue. A noble, broad, tree-



Euclid Avenue, Cleveland's busiest street. Cleveland is a busy city; it is famous for its refining of oil and for its iron and steel manufactures. Why does it have these specialties?

shaded way it is, with its mansions set in beautiful lawns and gardens. The avenue leads us out to a chain of fine parkways,

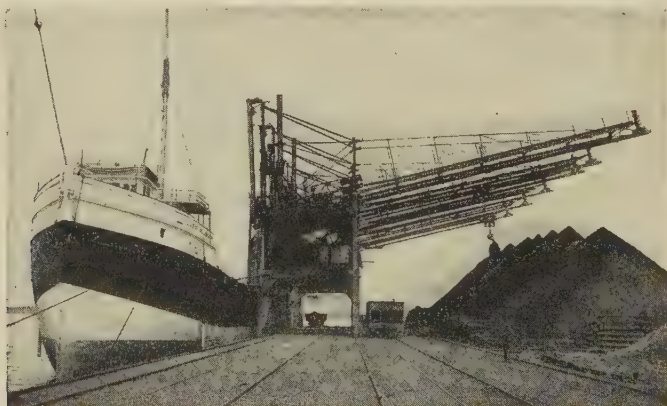
for the city prides herself on giving her people enjoyment and health through her public spaces.

When we return to the lake front, Ruth takes us to admire the tall marble memorial to President Garfield who was born on a farm within a short distance of Cleveland; then we go on board the long steamboat which is to carry us to the next port. Our vessel is taking on some of the well-known automobiles which coal and iron combine to make. Nearby a freight boat is being loaded with coal, a whole carload sliding into its deep hold at one time. Another freighter is discharging iron ore. Great, greedy grab buckets go down into the hatchway and come up with such big mouthfuls of ore that they unload the boat more quickly than hundreds of workmen could do it.

The End of Lake Erie.—Our boat whistles, making Alice jump and put her hands over her ears; then we are off toward the West. For many miles we travel. With field glasses the boys amuse themselves by looking at the towns on shore. Some of them, such as Lorain, are small Clevelands, with steel works; some of them are trade centres for farming country. At last we come to the southwestern shore of Lake Erie, where the Maumee River flows in. Farther up the river, in Indiana, is Fort Wayne, a railroad centre, and therefore a good place for car shops and machine works.

Our boat goes into the Maumee and ascends it for nine miles to Toledo. It is fitting that Fort Wayne and Toledo should be united by the same river. Fort Wayne takes its name from that dashing soldier, Anthony Wayne, gallant in both the Continental and the Federal services, while Toledo is nearly on the spot where Wayne crushed the Indians of the West in the battle of Fallen Timbers and thus opened the Northwest Country to settlement.

After taking on more automobiles, as well as big sheets of plate glass and many cases of new glass bottles—for Toledo, like Pittsburgh, is a glass centre—our vessel goes out again into the lake and we head northward. Before long the lake ends, and the vessel pushes against the swift current of a large river. This is the Detroit River, which is one of the boundaries of the United States. Its name comes from the French, and signifies a strait or channel. The stream is



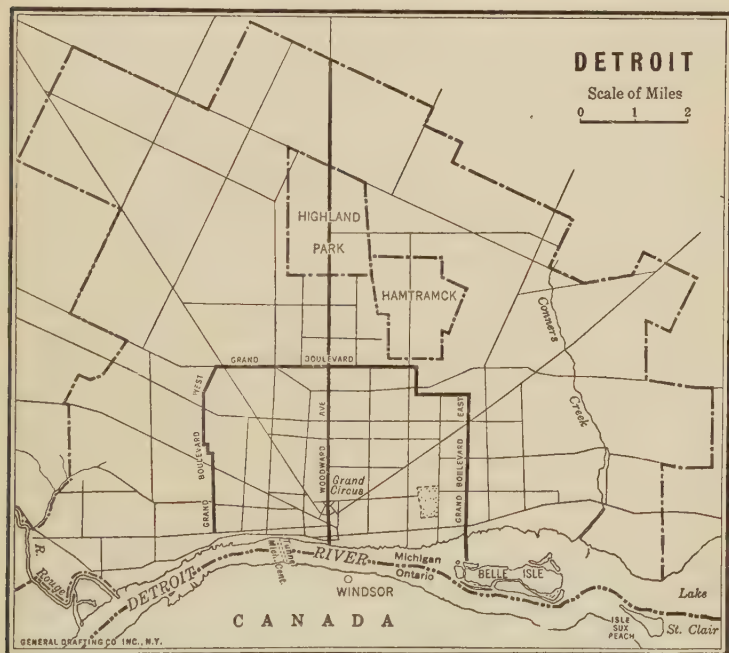
Iron ore from Minnesota being unloaded at a lake port. Machinery does all the work. What port do you think this might be?

well named, for it is not a river at all, but a channel less than thirty miles long which forms part of the waterway between Lake Erie and Lake Huron.

The Automobile City.—Ten miles from the upper end of the “river” we reach the city of Detroit, whose water front takes up the United States shore along the remainder of the strait and spreads out along Lake St. Clair, which we now enter. Detroit is fourth largest city in the United States, coming next to Philadelphia, although it is not much more than half so large as the Quaker City. Detroit is of

such an area, however, that the two good-sized cities of Hamtramck and Highland Park have been surrounded by the Detroit streets and are quite overshadowed.

Detroit is growing with marvelous speed, and the chief reason why it grows is the motor car. Just as Akron is



the "Tire City," so Detroit is the "Automobile City." Many of the best known cars are made in the city. "I feel at home here," laughs Jack, "because I see the names of old friends along the streets." Lansing, the capital of Michigan, and Flint, not far away, also make automobiles, but Detroit is the great centre for the industry.

"Why did automobile making centre to such a great extent in Detroit?" Fred wants to know. Partly because auto-

mobiles are "horseless carriages," and like carriages, the first automobiles were made of wood, employing skilled carriage workmen, who were plentiful in Detroit. Other cities would have been as good in this respect; but when automobiles began to be made of steel, Detroit found that she could easily and cheaply get iron ore by water from one direction and coal from the other.

Making Automobiles.—We visit the largest automobile factory, which can turn out seven thousand motor cars in one day. How is this possible? By two things—standardization and division of labor. Standardization means using the same size parts in every car, so that they can be made by millions if necessary. Division of labor means that instead of one man doing many kinds of work, each workman performs a small operation and does that over and over.

In this big factory a line of workmen stand in front of a moving conveyor. As the frame of the machine passes along, each workman puts on a part until the car comes out at the far end ready to run, although it still needs some finishing touches. Thus, small, cheap cars are produced by millions each year.

American skill, American efficiency, and American business methods have succeeded in giving the United States three or four times as many automobiles as the rest of the world combined. We have a motor car for every seven persons in our country. In most lands only the well-to-do can afford to own a car just for pleasure, but here the average citizen can keep a "gasoline wagon." During the Great War, in time of need, an entire French army was rushed to the front from Paris in taxicabs, but if it were necessary, the United States could move the whole nation in its motor cars and motor trucks. No other country could do this.

A View of Detroit.—An automobile is at our disposal to take us about the beautiful city. We start from the park

of the Grand Circus, near the river, and from that half-circle our car swings north into tree-shaded Woodward Avenue, the principal business street, which divides the city into almost equal parts. As the avenue begins to be lined with residences, we go into magnificent Grand Boulevard, which surrounds on three sides the heart of Detroit. As we ride we see interurban trolley cars which can take us to Flint or back to Toledo.

"Let's go to a foreign country," suggests Fred, so we take a trip by the tunnel of the Michigan Central Railroad under the river and spend a while in the town of Windsor, just to say we have been in Canada. Then we take a launch which darts in and out among the islands in the stream. On some of the green islands are fine residences, on some are summer resorts. The largest of these is Belle Isle, a city park, with picnic grounds, an athletic field, and waterways for canoeing. A wonderfully attractive city is Detroit, and as the automobile industry increases, it is sure to become greater still.

QUESTIONS AND SUGGESTIONS

1. Name some uses of rubber beside those given in this chapter.
2. Why has Cleveland grown so much faster than Windham?
3. How is glass made? Give a three-minute talk on the subject.
4. Read about George Judson's ride in one of the first automobiles of Detroit. The story is told in *Man's Country*, by Peter Clark Macfarlane.
5. What are the largest ten cities in the United States?

CHAPTER XXVII

SUGAR AND WATER

The Lower Peninsula.—Westward from Detroit we drive, until we come to Jackson, which manufactures many kinds of farm machinery and farming tools. By this sign Fred guesses that much farming is done in Michigan, and he guesses right. Michigan consists of two peninsulas. Which is the larger? Two-thirds of the southern peninsula is mostly good farming country, whose growing season is made shorter in the spring and longer in the fall by the influence of Lake Michigan. Corn is raised in this southern portion, but the farmers also grow other crops which do not need so much heat—potatoes, beans, peas, and sugar beets.

West of Jackson is Kalamazoo, which manufactures much paper. A couple of hours' ride north of Kalamazoo brings us to Grand Rapids, on the same Grand River which flows by Jackson, which is much farther upstream. Grand Rapids is the most famous furniture making centre of the United States. "When my father and mother went to buy a new dining-room table," remarks Ruth, "they were shown several tables which came from a Grand Rapids factory." Do you notice that farming tools, paper, and furniture all remind us of wood? Not many years ago Michigan was a great lumber state. Now much of the best timber has been cut away, but the wood industries remain.

Beet Against Cane.—About as far northeast of Grand Rapids as Grand Rapids is from Kalamazoo stands the city of Saginaw; and as we drive across country we pass many fields with long rows of curly-topped sugar beets. When nice red beets are served at your table, have you noticed that

they have a naturally sweet taste? "I say they must have some sugar in them, then," says Fred quickly. Yes, it is sugar which gives the sweetness. Listen to a story.

When George Washington was a young fellow, a German chemist examined many vegetables of temperate regions, to see which had the most sugar. He determined that the sweetest vegetable was the beet. A French student, taught by this German, actually succeeded in making sugar from beets, but as he could not properly purify it, the beet sugar tasted and smelled somewhat sickening.

Necessity, as we often say, is the mother of invention. War began between France and England. The powerful English navy drove French ships off the seas and prevented France from getting sugar from the tropical East Indies and West Indies. Sugar in France became much scarcer and much dearer than it even was with us during the Great War. Napoleon, ruler of France, set his chemists to work, and they succeeded in making good beet sugar.

"Now," said Napoleon, "we can raise our own sweetening. We have made sugar a product of the Temperate Zone." It was a great triumph for the chemists. Today there is made in the world about half as much beet sugar as cane sugar, and France and Germany are two of the greatest countries in raising sugar beets.

Growing Sugar Beets.—Sugar beets grow best just north of the best corn fields, and they find a pleasant home in this southern peninsula of Michigan, especially where the nights are too cool for making corn grow quickly. In the midst of the beet fields are immense buildings, which are complete sugar factories. Elsewhere in the United States the factories which make raw sugar are not usually near the refineries which purify raw sugar; but these big Michigan "plants" take sugar through the whole process, until it comes out in sparkling white grains. The beet sugar factories are

built so large, in order to handle sugar cheaply, that several thousand acres of beets must be planted to supply the factory with enough material.

As the little plants come up they must be weeded. This work has to be done by hand, for no machine has yet been able to take away the weeds and leave the delicate beet plants. Consequently, whole families of workers, men, women, and children, mostly from foreign countries, may be seen at certain times of the year creeping along the rows while their busy fingers work swiftly. "Do these laborers work with their noses?" asks Jack, as he sees them so close to the ground.

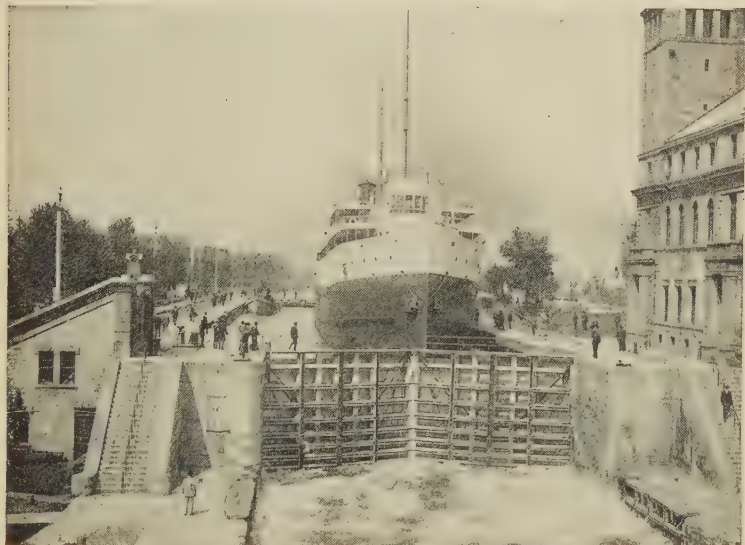
The Sugar Factory.—At last, being weeded and tended with care, the beets are ripe, then they are plowed out of the ground and the workers pull off the leafy tops. The sugar beet is a thoroughbred vegetable. It is a giant among beets, for it may weigh several pounds, and it has been "bred" so carefully that nearly one-sixth of it is sugar.

When the beets reach the nearby factory, they are washed, then they are thrown into machinery which cuts them to pieces or grinds them up. After that the flesh of the beets is soaked in warm water, which dissolves the sugar. This sweet water runs out when they are pressed, forming a juice like that of cane, which is treated in the same way to make sugar. It would be hard for you to tell whether refined sugar came from cane or beet; in most cases there is no difference in either appearance or taste.

The sugar factories expect to use up the crop of beets in about three months. Then the expensive machinery stands idle the rest of the year, while the workmen find jobs on the surrounding farms. "I suppose Michigan is the most important state for sugar beets," remarks Alice. No, it is surpassed by Colorado, where we shall see the beets again,

but this time on irrigated land. In the United States we raise six pounds of beet sugar for every pound of cane sugar which the planters of Louisiana furnish us.

From Saginaw to the Soo.—Continuing our way to Saginaw, we visit the “bean elevator,” where dry beans are sorted and stored just as the wheat of Western lands is kept



One of the two locks on the American side of the “Soo.” How can you measure the size of the steamer in the lock? What force is opening these big heavy lock-gates? How can you tell whether the steamer is going up or down?

in the grain elevators. Next we look into a canning factory, in which skilful women prepare peas and sweet corn, while men run the ingenious machinery which fills the cans. As an advertisement has it, “These cans make summer last all the year.” How would your mother like to prepare meals this winter without canned vegetables?

At Saginaw we go aboard a big steamer which loads up with bags of sugar and cases of cans and takes us down

the Saginaw River, past the port of Bay City, and out into Saginaw Bay. Northward we go through Lake Huron; we leave on one side the Strait of Mackinac, which would lead us into Lake Michigan, and continue on to another strait, the gateway to Lake Superior.

Lake Erie, Lake Huron, and Lake Michigan are almost on the same level, so it is no trouble for a vessel to pass from one to the next. "Superior" means higher, and the surface of Lake Superior is twenty feet above that where our steamer floats, so that the swift waters come foaming through the passage between, which is called the St. Mary's River. At the most disturbed place, which is called the Sault Sainte Marie, or St. Mary's Falls, canals have been built, four on the Michigan side and one on the side of Canada. These canals are called the "Sault" or "Soo" canals, and in each one is a lock, to make the step up or down for our boat as the case may be.

So big is the largest lock that it can take in two steamers like ours end to end, and yet it can lift or lower these on a cushion of water a distance of twenty-four feet in less than fifteen minutes. Through the St. Mary River passes a stream of freight which is greater than that carried by any other canal passage. The Panama Canal does not compare with it. For six months of the year steamers pass the "Soo" constantly just as fast as they can be locked through. To this great stream of cargo is added another coming from Lake Michigan, and the two together flow down through the Detroit River. Ships by thousands bear iron ore, copper, and lumber eastward and take westward coal, machinery, kerosene, gasoline, in fact all kinds of bulky goods.

The Copper Peninsula.—From the "Soo" our steamer glides over the deep, cold waters of Lake Superior, highest and largest of the Great Lakes—in fact, it is the largest body of fresh water in the world. About a hundred miles west

from the "Soo" there rise, along the southern lake shore, bold cliffs, whose red and gray sandstone has been colored with streaks of bright yellow and green from the mineral stains of trickling water. Wave and wind have worn these "Pictured Rocks" into such strange shapes that the Indians feared to pass them, but our kind captain goes as near to the cliffs as possible, to give us a good view.



Copper ingots ready for loading on a lake steamer, Michigan. Show on the map where these ingots are piled up. Of what do these ingots remind you?

Ahead of us a long rocky peninsula juts into the lake. In this Keweenaw peninsula are great copper mines, which once made Michigan the great copper state of the Union.

In all other copper mines the copper is mingled with other materials so that it does not look like copper, but in Michigan, grains and masses of reddish copper are scattered through the rocks. Sometimes these masses of pure copper weigh tons; the Indians used to knock them out of the rocks, then hammer them into rude hatchets or spears. The first copper mines sunk by white men were not successful, but

a young man, Alexander Agassiz, examined the rocks thoroughly and made up his mind that they contained great wealth.

Agassiz and His Mines.—Alexander Agassiz was the son of Louis Agassiz, a Swiss professor of natural history, who came to the United States. Louis Agassiz became famous for his knowledge and his skill in teaching, but he remained a poor man. When someone asked him to give up study and teaching and to go into a profitable business, he said, "I have no time to get rich." Alexander, like his father, liked to study, but he had a good business head. He interested some rich Boston men in the copper mines; a company was formed, and Agassiz directed the mining. The company proved to be very profitable, and in a few years Agassiz became a rich man. Then, in his father's way, he devoted the rest of his life to helping along the study of natural science.

In old days the red men managed to get their canoes across the peninsula, to avoid the long, stormy voyage around it. Now our vessel follows a good waterway, cut where the birchbark canoes used to pass. On the wharves along this canal we see great piles of copper bars, waiting to be carried down the lake.

Our country produces about half of all the world's copper. How could we get along well without this useful metal? "Copper wires carry the 'juice' to our trolley cars," says Alice. "The telephone and the telegraph send their messages over copper," adds Jack. "Cartridges for shooting are made with copper cases," chimes in Fred. "Everything made of brass or bronze contains copper," exclaims Ruth, triumphantly. Though Michigan is no longer the chief copper state, we all benefit from her help in producing copper, the "electrical metal."

A Wonderful Waterway.—As we go farther westward the lake narrows. Our voyage nears its end. What a wonderful set of waterways we have in the Great Lakes! A journey down through them, from the end of Lake Superior or that of Lake Michigan, passing around Niagara Falls, then out of Lake Ontario by the mighty St. Lawrence River and on to the Atlantic, is two-thirds as long as a voyage across the Atlantic itself from New York. Eight great and rich states border upon these “unsalted seas,” and the mines, woods, farms, and factories of Canada help to swell the immense volume of Lake commerce. Even though ice shuts the lake path during four or five months of the year, the business of the remaining months is vast enough to make up for this stoppage.

QUESTIONS AND SUGGESTIONS

1. In what ways have chemists been able to benefit you and me?
2. Write a sentence explaining how canning factories “make summer last all the year.”
3. Are sugar-beets an “intensive” crop? Explain your answer.
4. What other canals have we seen on the trip through our country?
5. Sketch a map of the complete voyage through the Great Lakes. Show the important cities which are situated on the lakes.

CHAPTER XXVIII

IRON AND MILK

The End of the Voyage.—At the very end of Lake Superior, where the St. Louis River flows in, Du Lhut (Du Lú), a French explorer, built a fort. Such a situation, where river and lake meet, is a good one for settlement, and now the great city of Duluth stands on the spot. A curved tongue of land seven miles long encloses Duluth's harbor, and through this "Minnesota Point" two canals have been cut, admitting ships.

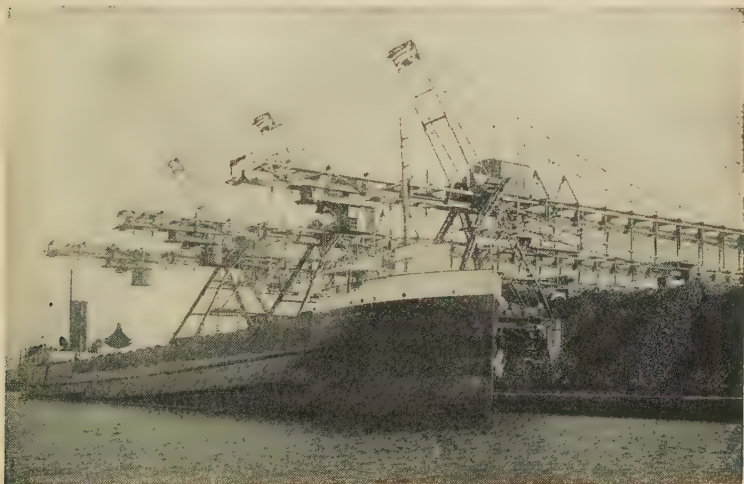
Because goods are carried more cheaply by water than by land, cities at the ends of waterways draw much trade to themselves. Duluth is a receiving and distributing point of goods for a great region surrounding it. Wheat and oats from neighboring states, flour, lumber, and especially iron ore, come pouring into the city from one direction; coal and all sorts of manufactured goods, bought with the grain, lumber and ore, come from the other direction.

As we come to Duluth, Jack calls out, "See there; those must be the ore docks!" That is right; they are high trestle-work structures, some of which run out into the water for half a mile. Out on these high docks comes a train of loaded cars; it stops, the car bottoms open, and the red ore falls into great bins.

Below, at the side of the dock, lies a long, ore-carrying vessel. See, the "hatches" have been removed, so that almost all the deck on one side is taken away. Steel troughs drop from the bottoms of the bins and through them torrents of ore rush into the hold of the ship. "Listen, I can hear it

roaring down," cries Ruth. In three hours many thousand tons will be put aboard, and the vessel will be ready to steam off with a cargo for Detroit, Cleveland, or Pittsburgh.

A considerable amount of iron ore is used in Duluth itself, for we see a blast furnace and a steel mill. What does this mean? It means that some day Duluth will probably be making steel for the Northwestern states. "Yes,"



Unloading coal at Duluth. Why is this coal so greatly needed? How does this steamer differ from a Mississippi River steamboat? Why?

says Fred, "what's the use of taking iron ore all the way to Toledo or Buffalo and sending it back again to Duluth as manufactured iron or steel?" Freight charges always add to the cost of articles, and to be efficient, people should try to avoid hauling material any farther than is necessary.

Back to the Mines.—Let us go back to the mines which supply the great stream of iron ore pouring down the Lakes. So much iron is found around Lake Superior, the ore is so rich, and it can be transported so cheaply, that many good

iron mines elsewhere in the United States have been closed. Our country beats any other in producing iron and steel, and three-fourths of all the iron ore we have used has been taken out of this region.

Near the Pictured Rocks in Michigan is one large iron field, and there are several fields in Michigan and Wisconsin; but most of this great supply of iron ore comes from Minne-



An open-pit iron mine, Minnesota. This is the Mesaba Range, which is not far from Duluth. From what work are the open-pit miners spared?

sota. We travel only a short distance west of Duluth before we arrive at the mines. The iron ore is found in low ranges of hills, and the nearest of these to Duluth is called the Mesaba Range. Not far east of this is the Vermilion Range.

At the mine to which we have come there is no sign remaining of a hill. Instead, a great sloping pit meets our view. Down at the bottom are men boring holes to blast out the ore, which is "rusted" or "cemented" into hardness. Boom! Off go the heavy blasts, and we all jump back.

As soon as the dust has cleared away big steam shovels dig into the broken fragments. Five, ten, fifteen tons of ore come in in one shovelful, and are dropped into a waiting car. In five minutes the fifty-ton car, full to the top, is pulled along, and another car takes its place.

One of these steam shovels could put in the winter's coal of your family with a single dash. By the use of these shovels this iron mine can dig and load as much ore in an hour as underground mines can do in a day. Such mining is called "open pit" mining, and is a cheap way of working. Of course it can only be done when the ore is near the surface. A few coal mines are worked in this way. Now a locomotive pulls a train of filled cars up the slope to the surface; off goes the train toward Duluth, and we think it is time for us to go too.

A Land of Silos.—From Duluth we drive southeastward through Wisconsin. "That must be another Indian name," remarks Alice. Yes, it means in the Indian tongue "brown rushing waters," and the clear brown streams took their color from the roots of the forest trees among which they wound their way. Much of the forest has been cut, but we pass through many stretches of woodland which remain. Every now and then we catch a glimpse of a beautiful little lake, inviting us to a rest, a swim, or a picnic. The people of Wisconsin are fortunate in having had a great ice sheet, that moved over the country ages ago, gouging out these water-filled hollows and blocking up the outlets of streams. Thus were formed hundreds of attractive lakes.

This lake country has many pretty farms, and alongside the barn of almost every farm is a round tower-like building, called a "silo." The silos stand like signs, each one saying, "This is a dairy farm." When a man goes into the dairy business, people expect him to furnish so much milk each month. In summer that is usually easy, but winter and early

spring are the trying times. How can the cows get green food then, and if they do not, how can the supply of milk be kept up? Silos are the answer.

There is a farmer coming out of his gate. "I'm sure he will tell us the advantage of having a silo," exclaims Ruth. She speaks politely to him, and the pleased farmer begins at once: "In the silo green food for the cattle is stored away. First it is run through a machine which cuts it into small pieces, then it is packed tight into the silo. There it ferments a little, just enough to give it a little sourness which animals like, but it does not spoil. All through the 'off' season cattle can have this good green food, which keeps them healthy and makes them produce milk. Many crops, such as alfalfa, can be cut into silage, but corn is the usual filler of the silo."

The Dairy State.—Corn should be green when put into the silo, and that is fortunate for Wisconsin. To harden and ripen the ears of corn, hotter nights are needed than most of Wisconsin has, so corn would not be a good crop for grain except in the southern part of the state. Sweet corn, which is canned before it is ripe, can also be produced to good advantage.

Silos mean dairy cows, and dairy cows mean fertile farms. Wisconsin is the greatest dairy state. A dairy farm should have plenty of pasture, and as milk is largely water, there should be plenty of water for the cows to drink. In the cool, moist Wisconsin climate grass grows well and is the best crop for the many hillsides where the soil would wash if they were plowed.

There is only one very large city in Wisconsin, so there is not so much call for the fresh milk as there is near New York and Philadelphia, although Chicago takes a great deal. Much of the milk of Wisconsin cows goes to creameries which make butter, to factories which make cheese, or

to other factories which make condensed and evaporated milk. Condensed milk contains much sugar, while no sugar is put into evaporated milk except that which it has naturally.

Along the Lake.—As we reach the eastern part of Wisconsin we come into low land, the beginning of the prairies, which stretch far southward and westward; now we come to the shores of Lake Michigan, and see Milwaukee, Wisconsin's chief port and city. A harbor with three arms allows vessels to come right into the heart of Milwaukee. The city manufactures machinery for the mines of iron and copper to the northward, it tans into leather the skins of the many cattle of Wisconsin, and then makes the leather into shoes. A ride of less than an hour southward along the rippling lake leads us to Racine, which is in most of its industries a copy of its big neighbor Milwaukee, as is very natural. On we travel, almost a hundred miles, keeping company with the lake, until the thickening traffic tells us that we are nearing Chicago, the giant city of the prairies.

QUESTIONS AND SUGGESTIONS

1. Find other cities, beside Duluth, situated where river and lake meet.
2. Read in Conan Doyle's story, *The Refugees*, how Du Lhut saved the travelers and then helped to defend the chateau.
3. Does your state produce iron? How does it compare with Minnesota in this respect?
4. What farmers in your neighborhood have silos? What does your report show about your neighborhood?

CHAPTER XXIX

THE MAGIC SPOT

McCormick and the Mud-hole.—In the year 1844 an inventor named Cyrus McCormick, traveling through the new states of the West to find a spot for his reaping machine factory, came to a town called Chicago. It was a forlorn looking place. Although it had ten thousand people, its streets were unpaved and deep in mud. It had no railroad, no telegraph, no gas, no sewers. Around the town lay miles of swamp, and its shallow harbor was not inviting to vessels. The people of Cleveland and St. Louis despised Chicago and called it a mud-hole.

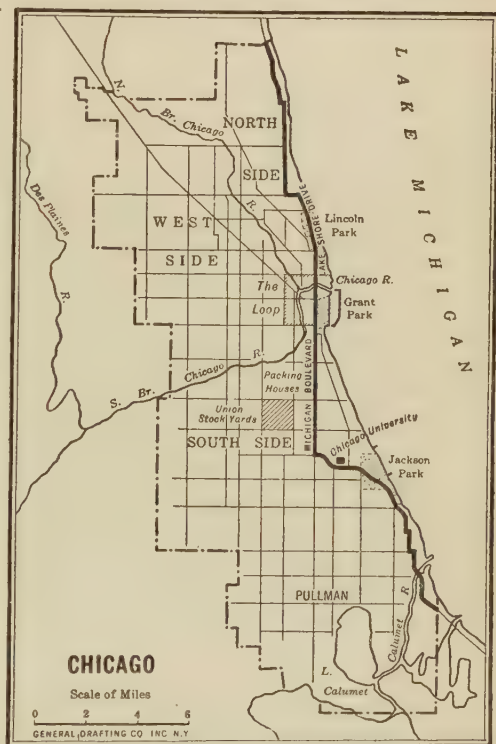
Yet McCormick put his faith in the future of that shabby town. He was sure that the grain of the West, harvested by his reaper, would make Chicago grow into a great city and would bring both ships and railroads to the "mud-hole" by the lake. His faith was justified. Today Chicago is the second city of the United States, half again as large as Philadelphia, which is next in size. It has left Cleveland and St. Louis far behind in population; it is our greatest railroad centre and one of our chief ports. "But what brought about this wonderful change?" asks Jack.

A Favored Seat.—It so happened that Chicago was located at a magic spot, a spot whose spell grew stronger as our country grew. We learned at Buffalo, at Toledo, and at Duluth, that a place at the end of a lake is a good one. The best place near the end of Lake Michigan was at the mouth of the little Chicago River, which flowed through a low marshy valley. No other such favorable harbor was available. The commerce of the lake could come that far

and no farther. As trade on the lake increased, Chicago was bound to grow. When railroads were built they were forced to run around the southern end of the lake and naturally centred at Chicago, where they could meet the steamers. The city, then, was especially blessed in regard to commerce by land and water. What products did it have to ship?

Chicago holds a position at the eastern edge of that great wheat belt which we shall soon visit. As the wheat belt grew in importance year by year it furnished more and more grain and flour for Chicago to handle. Chicago stands moreover, at the northeastern corner of the vast corn belt which we are also about to visit. She ships out yearly even more bushels of corn than of wheat. The animals of the corn belt come to her in enormous numbers to be slaughtered.

Midway between the Atlantic and the Rocky Mountains, between the East and the West, Chicago has her place, receiving the abundance of the West and sending it to feed the



multitudes of the East. She controls the main trade of the most productive region on earth. Today Chicago is the greatest railroad centre of the Western Hemisphere. Not one railroad passes through Chicago, but many end or begin there. It is a marvelous transfer point for passengers and goods. Here, too, are the wonderful mail-order stores, from



A part of the Chicago stock yards. What other cities have great stock yards? What work is each of the men in the picture going to do?

whose bulky catalogues the far-off miner, farmer or lumberman can order almost anything that he or his household chances to need.

Not alone is Chicago a great commercial centre, she is also a great manufacturing city, second only to New York. Two-thirds of all the manufactures of Illinois come from Chicago. Meat packing, iron and steel manufactures, and the making of clothing, are her chief industries, but there are

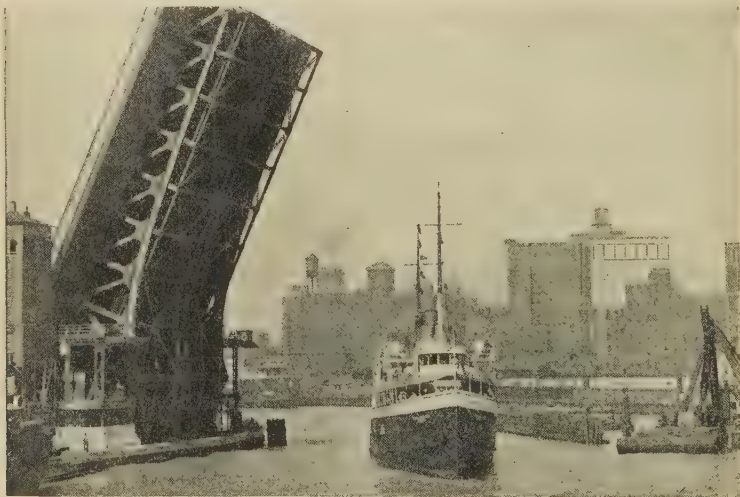
many other lines of important business. Lumber from many a state, Michigan copper, Minnesota iron ore, and Illinois coal are within easy reach. No wonder that Chicago is great in manufacturing.

The River That Turned Backward.—"Let's hurry up and view this wonderful Chicago," speaks up Fred. "What's the best place to begin?" Well, let's begin at the "Loop," which is a small but exceedingly busy district along the lake, just south of the Chicago River. This is the heart of Chicago, the centre of business, shopping, and amusement. Many skyscrapers like those of New York are here. Just as Galveston raised the surface of her island, Chicago raised the low surface of the Loop, making it about fifteen feet higher.

We walk to the river, whose mouth has been deepened and protected by great piers, and there we learn a remarkable fact. Chicago has actually made the river run backward! Out in the lake, miles from shore, are buildings called cribs, where intakes supply water to the city pipes. As a large part of Chicago sewage drained into the river, there was danger that it would spoil the lake water even at the cribs.

Engineers explored the valley of the sluggish little river, and found that there was a long hollow reaching from Lake Michigan westward. "In fact, ages ago," said the men of science, "the water of the Chicago River flowed at last into the Mississippi." "We will make the river flow backward, then, as it once did," said the engineers, and they led its waters into a canal which took them to the Des Plaines River, which flows into the Illinois River, which flows into the Mississippi. This Drainage Canal has not only greatly improved the health of the city, but it also furnishes electricity for lighting Chicago's streets. In future years it may become part of a ship canal by which vessels from New Orleans reach Chicago.

Commerce and Manufacture.—The Chicago River is lined with docks, warehouses, factories, and grain elevators. In the southern part of the city is the small Calumet River, which is almost as important. In all, Chicago boasts of over fifty miles of docks, which are served by thirty-nine railroad lines. A train comes into Chicago or departs from that city on the average of every minute of the day. The big freight



A lift-bridge over the Chicago River. This bridge rises to allow steamers to pass. Why is this kind of bridge a good one to have on a busy street over a busy river?

steamers which bring iron ore go to the Calumet River docks, for the iron and steel works are situated in South Chicago.

After seeing a little of Chicago's commerce, we must see something of its manufacturing. Of course we wish to visit the harvester company which Cyrus McCormick founded. It has grown into an enormous concern, which turns out more than a thousand reaping machines a day. Other such companies have joined in the "farming implement" business, until Chicago makes a million harvesters,

tractors, wagons, harrows, and cultivators every year. As the farmer rides about on his farm wagon or farm machine he may thank the busy city of Chicago, which also sends such machinery to help far-off countries do their harvesting.

Most of the workmen in the factories of Chicago seem to be foreigners. In fact, a large number of the immigrants who have entered our country have come to this city where are so many opportunities for willing workers. Three-fourths of the people of Chicago were either born in foreign countries or have parents who came from abroad. We remember the great number of foreign-born persons who live in New York City, and we come to the conclusion that the largest cities contain the most foreigners.

Saving Everything.—Some distance southwest of the Loop are the Union Stockyards, which make Chicago the greatest livestock and meat packing centre of the world. As we leave the elevated road station and enter the yards they seem like a city in themselves. Here are tracks and tracks, with livestock cars moving and still, empty and full. Out of one train are coming bellowing cattle, from another, bleating sheep, and here is a stream of squealing pigs. All go into the five hundred acres of open pens, are given good care, and wait for their fate. By tomorrow all of them will be dead, or shipped away again, and other animals will be in their places. More than 150,000 animals can thus be disposed of in a day.

Scarcely has an animal been slaughtered when he is hung up on a track and is moved along from one man to another just like the motor cars in Detroit. However, instead of each workman adding a part in this case he is taking it away. At last every portion of the animal is used; nothing at all is wasted.

The hides and skins are made into leather, some of the bones into handles, combs, hairpins, or buttons, and some

are turned into fertilizer or are burned into charcoal for refining sugar. The blood is used for fertilizer also, and the hoofs, scraps of horns, bones, and skin are boiled down into glue. From the waste fat is made soap. Some of the special glands furnish medicine, and even the bristles of pigs are set into brushes of various sorts.

As for the meat, refrigerator cars carry it a thousand miles if necessary, to branch warehouses scattered over the country in many cities and towns. It is even taken across the ocean in cold storage compartments without spoiling. The village butcher finds that he does not need to slaughter animals now; he buys from the nearest slaughtering plant. By smoking, the hams, shoulders, and bacon of the pigs are preserved. Beef, tongue, and ham are also cooked, then pressed into cans. A list of all the products of the packing houses would be a long one. No wonder that seventy-five thousand employees are engaged in this big Chicago business.

A Ride by the Lake.—From the Loop we start northward on beautiful Michigan Boulevard, passing many fine shops, which Alice says are like those of Fifth Avenue in New York. Leaving Grant Park behind us, we follow the shore of the lake, past the “Gold Coast,” with its handsome homes, to the Zoo in Lincoln Park. On the way Fred calls out, “Look at that bathing beach; there must be thousands of people cooling off.” Chicago stretches along the lake for such a distance that almost everyone can reach the water without a very long ride, and she has therefore kindly provided a number of bathing places.

From Lincoln Park we could spin along the Lake Shore Drive toward the woods and lakes of Wisconsin, but we must turn back, although Jack entreats us to drive “just a little farther.” Passing the Loop again, we soon see the great University of Chicago, whose buildings are patterned after those of the old English Universities. Then we reach Jack-

son Park with its golf courses, its lagoon, and its museum we think of the day when all three lake front parks will be



Michigan Avenue, Chicago. What street in your city corresponds to Michigan Ave.

united into one playground nearly fifteen miles long, and hope that this will be done by the time of our next visit. Chicago is rapidly making itself a City Beautiful.

Still going southward, we cross the Calumet River and enter the very different region of South Chicago, where steel is king. It is not beautiful, but we appreciate its usefulness, and continue to follow the curve of the lake until at its exact southern point the chimneys of Gary rise before us.

About half the bulk of cargo which the lake steamers bring to the end of Lake Michigan is iron ore. The greatest steel company of the world decided to establish a new plant where land was cheap, where steamers could easily discharge their ore, and where it could extend its plant whenever it wished. Accordingly, the company bought a great tract of sandy waste land, made an artificial harbor, and in 1906 founded Gary, which it called by the name of the head of the company. Now Gary is a city as large as Racine; although the soil is sandy, we may say that Gary is founded upon steel.

QUESTIONS AND SUGGESTIONS

1. Explain why Cyrus McCormick's judgment was excellent.
2. Sketch the course of a drop of water flowing from Lake Michigan to New Orleans. What large cities would it pass on its long trip?
3. Examine the **implements** and machines on a farm in your neighborhood. Where was each of them made?
4. Where does your butcher get his meat? Where was it killed? How is it kept from spoiling?

CHAPTER XXX

KING CORN

To Ohio's Capital.—From Gary our road takes us eastward to South Bend. "That name reminds me of a river," says Ruth, thinking hard. Yes, at this place the southernmost curve of the St. Josephs River, which flows into Lake Michigan, comes within five miles of the Kankakee River, whose waters join the Mississippi. Here the Indians used to carry their canoes across the portage, and here the explorer La Salle actually lost his way, although his anxious friends found him next morning safe and sound.

We pass on through Indiana, traverse a considerable part of Ohio, and reach the state capital, Columbus, on the Scioto. How many of the cities founded before the Civil War were built on the banks of navigable rivers! Before leaving Columbus we must see the capitol building, in front of which is a memorial to the murdered President McKinley. Near one corner of the capitol is a group of seven statues, called "Ohio's Jewels." Three of these distinguished men were Presidents, five of them were commanders in the Civil War, and two were members of Lincoln's cabinet. Jack looks bewildered. "I can't make those numbers fit," he cries. Can you? Virginia has been called "Mother of Presidents," but Ohio is as worthy of the name.

Three Sister States.—About fifty miles west of Columbus are the cities of Springfield and Dayton. We visit the immense factories in Dayton where most of the cash registers are made for our nation's stores. Westward again we take our way to another state capital, Indianapolis, whose name



The Circle, with its soldiers' and sailors' monument, Indianapolis. Why is Indianapolis a center for certain kinds of manufactures?

means, "the city of Indiana." The engineer who planned Indianapolis had helped in laying out the city of Washington, so naturally he carried out the same ideas. Broad streets lead

from a centre circle, where once stood the governor's house, but now a tall monument rises. Indianapolis is in a prosperous region, and makes fine automobiles to sell to prosperous people.

Seventy-five miles farther on we cross the Wabash at Terre Haute, which is French for "high land." In one year, when Lincoln was a young lawyer, eight hundred steamboats reached this spot, but now the railroad has taken away the steamboat's glory. Soon after leaving Terre Haute the Indiana boundary is passed, and we drive northwestward to Peoria on the Illinois River, mingled with whose water is some from the Chicago Drainage Canal. Peoria is built at a narrow place in the river. For two hundred miles there is no other crossing point that is so easy. Of course that old ferrying place was a good spot to bridge the river, and railroads sought this situation. Many of the tractors for the prairie farms come from Peoria.

South of Peoria is another Springfield, the third state capital we have seen within a short time. This we may call Lincoln's city. Here he lived for many years, from Springfield he set out to take the President's chair, and to sorrowing Springfield his body was brought for burial. Lincoln's humble house is preserved by the state in memory of the great leader, a noble monument marks his grave, and his statue greets us as we enter the grounds of the capitol building. Ruth and Alice lay some flowers at Lincoln's feet, and Fred and Jack stand awhile with bared heads in silent respect.

The Corn Belt.—In our quick journey from Columbus to Springfield, through the three sister states, Ohio, Indiana and Illinois, we noticed a striking likeness in the land which we saw. "I observed," says Alice, "that almost all of it was rather flat, a wonderful farming country, and the keystone of

the farming was corn." As we traveled west from Columbus we saw more and more corn. In Ohio one acre out of every seven was a corn field; in Indiana more than one out of five; in Illinois one out of four; and if we keep on from Peoria and cross the Mississippi into Iowa we shall find corn covering that state even more thickly.

We have been going through a part of that rich region called the Corn Belt, which begins in Western Ohio, spreads through Indiana, Illinois, Iowa, Missouri, and ends about the centre line of Nebraska and Kansas. In that belt corn is indeed king. We see true "corn forests," waving seas of green leaves, higher than the head of a man as he stands in his automobile or motor truck. The land is fertile, and it is so free from hills and even from stones that it is easy to work. The summers are hot, with considerable rain, and though the growing season between frosts is not long enough for cotton, it is quite long enough for corn.

Our Greatest Crop.—Corn is our greatest American crop. It is king in more states than is any other farm product. Its value is greater than that of all the iron, the copper, the coal, the natural gas, the oil, the gold, and the silver which we extract from the earth. Corn covers one-quarter of all the land which we use for crops or pasture in the United States. In some way or other corn supplies our table every day. Yes, corn is king, and he is extending his kingdom northward every year, until now parts of Minnesota and South Dakota, which used to be wheat states only, are coming under the flag of King Corn.

The farmers of the Corn Belt declare that corn is the foundation of their prosperity. Many of them, especially those who are near Chicago, sell some of their corn, but most of it is used at home on the farm to feed animals. Americans like meat, and are willing to pay good prices

for it. The farmer who "sells" his corn to animals will make more profit than the farmer who hauls his ears of corn to market, and the first farmer will also have the manure of the animals to keep his farm rich.

A Corn Belt farmer says to us, "My corn goes to fatten pigs or cattle or lambs. If I do not raise enough animals,



A self-feeder for animals. Why is this a good idea? Would a self-feeder for girls and boys be successful? What would be put in this self-feeder?

I buy a carload from some state farther west, keep them until they are fat, then ship them to Indianapolis, Cincinnati, or Chicago. These contented corn-eaters have paid off the mortgage on my farm, built me a fine new house, given me an auto,

and sent my boys and girls to college." If the farmer is near a city or creamery, he may find it pays to keep dairy cows too, which help to eat the corn.

Pigs and Machinery.—The pig is the animal which seems most grateful for his daily meals of corn and of other good things—that is, he repays his owner by fattening up more quickly than any other animal if he is well treated. The Corn Belt states raise more pigs than any other seven states in the Union. Corn makes not only pork, but excellent beef, veal, mutton, lamb, poultry, eggs, and milk. If we cannot get good food in the Corn Belt, it will be very strange.

Of course the millions of farmers in the Corn Belt need machinery to cultivate their land. They must have plows, harrows, seeders, cultivators, harvesters, hayrakes, hay-

loaders, wagons, corn shellers, fodder cutters, gasoline engines, tractors, cream separators, and many more machines; so a great many of the cities of the Corn Belt, beside Chicago, make farm machinery. At South Bend is one of the greatest wagon factories in the United States, and to keep up with the times the city also makes good automobiles.

QUESTIONS AND SUGGESTIONS

1. Can you find in your state any Indian portages?
2. Why should navigable rivers be more important to cities before the Civil War than they are now?
3. Explain why corn is king.
4. Why are so many pigs raised in the Corn Belt?
5. How does Indianapolis resemble Washington?

CHAPTER XXXI

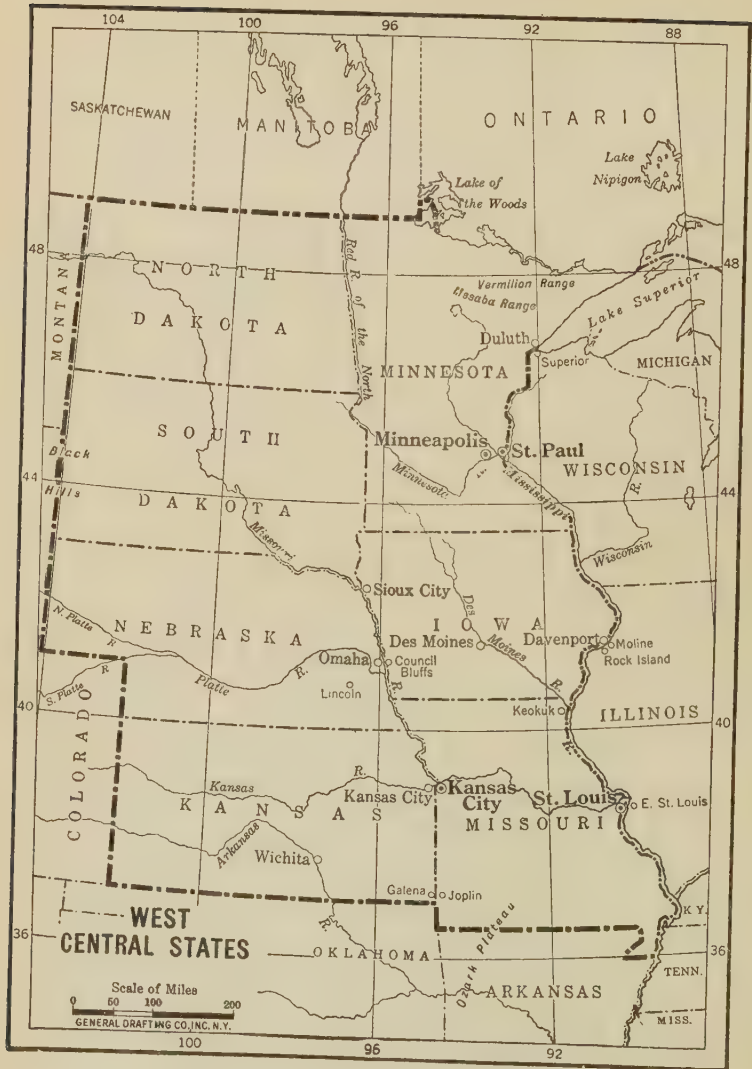
UP THE BIG MUDDY

An Early Western Queen.—By the Illinois Central we go from Springfield to the manufacturing city of East St. Louis, and across the Mississippi to great St. Louis itself. The bridge which carries us so safely over the river reminds us of our friend Captain Eads, for it was he who built it. Seven years of his life were given to the task; when it was finished, he could say, "Nowhere below this place has any one dared to try to bridge the Father of Waters." Today, however, there is a Mississippi bridge at Memphis, as you remember.

It is natural to suppose that a city should arise at the junction of the Mississippi and the Missouri. "Why isn't St. Louis there?" asks Fred. Well, the land at the junction proved to be so flat and marshy that the French fur traders who made the first settlement located it twenty miles below the junction, on some limestone hills which bordered the water. The name of the post came from that of a French king, so noble and good that he was called "Saint Louis."

St. Louis became the chief city of the growing West. As long as the steamboat was the best means of carrying passengers and freight St. Louis had no western rivals. The traders of the plains and the mountains were supplied from her stores, and the furs which they bought from Indian or trapper came back to St. Louis. To this day St. Louis is chief of our cities in preparing the skins and furs of wild animals.

One of Our Greatest Cities.—Since the Civil War, the steamboat trade of St. Louis has fallen away, as in the case



of all the other towns along the Great River; but Captain Eads' bridge made a direct way for the railroads, and now St. Louis has almost as many lines of track leading in and out as has Chicago. It is the sixth largest city of the United States.

St. Louis stands between the northern and the southern parts of our country and has a fair share in the trade of both portions. It is one of our foremost meat centres, so leather is prepared and great quantities of boots and shoes



St. Louis, Missouri, from the Mississippi River.

are made from the hides of the cattle which are slaughtered. Being such a large city, and near Kentucky, St. Louis uses enormous quantities of tobacco in various manufactures. Like New York and Chicago, St. Louis supplies the region around it with clothing.

You wish to view St. Louis. Why, of course. In the heart of the city we see the statue of Pierre Laclede, head of the "Louisiana Fur Company" and founder of this chief community on the Mississippi's banks. We enjoy a long automobile ride from north to south on Grand Avenue, we visit beautiful Forest Park with its museum and its statue

of good King Louis the Crusader, and we look at Tower Grove Park, smaller than Forest Park but well worth seeing.

Treasure of the Ozarks.—As we go southwestward from St. Louis, the hills rise higher and higher until their summits are on one level, and we have come once more into the Ozark region. We pass great bubbling springs of the purest water and cross strong streams flowing between walls of limestone rock. Some of these streams are being harnessed to light the streets and houses of Missouri cities or to furnish power.

On the slopes of the beautiful hills are large orchards of sturdy apple and productive peach, for the cold night air drains away from these slopes into the bottom of the valleys, thus saving buds in spring and fruit in autumn. The rivers which wore down the Ozarks have exposed to view some of the mineral treasures of the region, particularly lead and zinc. Let's stop and find out something about them.

The greatest mineral portion of the Ozarks centres at Joplin, in the southwestern corner of Missouri. Here, in 1870, a farmer discovered galena, or lead ore, in Joplin Creek. The name of Galena in Kansas, only a few miles away, will mark this in our minds. Missouri is the greatest lead and zinc state. Lead, beside being used for bullets, is the foundation of paint. Zinc, beside its value for brass making, is used to galvanize iron so that this metal, so easily affected by the air, will not rust. At the lead smelters of Joplin and Galena the lead ore is crushed; the metal is then separated from this rock, melted and run into bars called pig lead. The zinc goes to smelters in Illinois.

The Meeting of the Waters.—Having returned to St. Louis, we take a launch, just to do Jack and Fred a favor, and travel twenty miles upstream to the junction of the great rivers. It is usual to say that the Missouri joins the Mississippi, but we probably should put it the other way, for the

Missouri is the larger stream. However, as most of the navigation above St. Louis is on the Mississippi, that river has its own claim to be chief.

When the muddy Missouri meets the clear Mississippi the waters apparently do not like each other, for it is many miles, just as we saw near the mouth of the Ohio, before they really mix. "As I look up along the Missouri," says Alice, "I can follow it in fancy for nearly three thousand miles, up the high peaks of the Rocky Mountains." Yes, that lengthy course, added to the twelve hundred miles of the Mississippi below St. Louis, make the longest river way of the world. The Missouri can be navigated for twenty-three hundred miles, through the prairies and Great Plains, up into Montana; but on account of its shifting course, its shallow water, and its many sandbars, even little flat-bottom stern wheel steamboats find navigation very difficult, and not much use is made of transportation by the river.

Cities of Kansas.—On to the westward we go, taking the Missouri Pacific Railroad, along the banks of the "Big Muddy." We cross Missouri, and at the border of Kansas, where the Kansas River, chief stream of that state, comes into the Missouri River, we find twin cities, Kansas City, Missouri, and Kansas City, Kansas. A viaduct two miles long across the Kansas River unites the twins.

The Missouri city, however, has grown until it is three times as large as its Kansas twin. Because of the riches of the Corn Belt, it is prominent in making farm tools and machinery, it is a great slaughtering centre, and it is an important market for horses and mules. Because of the Oklahoma oil fields, Kansas City has become one of the great petroleum refining cities of the United States. "The city intends to be beautiful as well as prosperous," says a business man, as he sees us looking around. "She has more

park space in proportion to her people than any other place in this country except Washington."

Sixty-five miles up the wide and fertile valley of the Kansas River is Topeka, capital of Kansas, and centre of trade with the northeastern part of the state. It is still in the prairie lands, and corn is still king in its neighborhood, although large flour mills show that the wheat belt is not far away. Instead of taking the Atchison, Topeka and Santa Fé Railroad (commonly called the Santa Fé), to reach it, however, we merely glance up the Kansas River valley, then continue to follow the Missouri.

Not far above the twin Kansas Cities we reach St. Joseph high on its bluffs. Like Kansas City, Missouri, it is a meat centre. In the old days the pony express to California, beginning just before the Civil War, started from this point.

Another Pair of Twins.—Our trail leads along the river, until the mouth of the Platte, the main stream in Nebraska, is passed. Just above stands another pair of twin cities, Omaha and Council Bluffs. Omaha is an Indian name which a Nebraska tribe used, calling themselves "Upstream people" as against their red brothers farther south in Kansas.

In pioneer days, Omaha was the most northern outfitting point for the emigrants who set out for Salt Lake City, Oregon, and California. Naturally when the first railroad was to be built westward across country from the Missouri, Omaha was selected as its starting point. Although many other railroads serve Omaha now, this original Union Pacific still stands among the chief. At Omaha we are still in the Corn Belt and we learn that as in Kansas City and St. Joseph, the meat industry is noteworthy.

When Meriwether Lewis and William Clark passed up the Missouri, they held a "big talk" with the Indians. As Thomas Jefferson had instructed them, Lewis and Clark spoke softly to the red men, gave them medals to hang around

their necks and made them many other gifts. The spot of their conference has been called Council Bluffs ever since, and here Omaha's thriving twin city is located.

Following the River.—About fifty miles to the southwest of Omaha is Lincoln, Nebraska's capital and second largest city. Its earliest settlers were drawn to the spot by the salt springs which welled up there, but they num-



A Missouri River vista, Omaha, Nebraska.

bered only thirty when it was decided to place the capitol building out on the rolling prairie. Such an act showed the faith of the Nebraskans that the railroad and the land together would bring great growth; and their faith was justified. Corn and wheat have been good fairies for Nebraska and for Lincoln.

As the hungry Missouri has chosen to gnaw away its western banks above Omaha, we now cross into Iowa to

pursue our railroad journey beside the river. A hundred miles farther along the high banks of the stream bring us to Sioux City, where the Missouri changes its course from east to south. The Sioux, whose tribes counted more warriors than any other Indian nation, held the land north of this point. Intelligent, but cruel, they slew many a Minnesota settler, and on the plains of Montana massacred General Custer and all his men. "I recited a poem about that," exclaims Alice. "Longfellow wrote it, and it is called 'The Revenge of Rain-in-the-Face.'"

Though the industry of Sioux City is like that of the other Corn Belt centres, we have here come nearly to the northwestern point of that belt. Above this, corn is not raised so much for grain as it is for silage. As we have seen in Wisconsin the invention of the silo has enabled farmers to raise corn profitably where that would never have been possible otherwise. Thus the southern portions of the Dakotas and Minnesota share in the benefits which corn brings, but their corn goes to feed dairy cows rather than to produce meat.

Iowa the Rich.—Southeastward across Iowa we turn, and stop to visit one of the farmers on our way. We look across the rolling prairie on which lies his fertile farm, view his beautiful crops of corn and oats, and inspect the fine buildings which house his good livestock. "Iowa is the best farming state in the Union," says our friend. "Practically all of her land can be cultivated. She raises more corn and oats, and more pigs and poultry than any other state. She comes well up toward the front in dairying, and she has more students in her agricultural college than any of her sisters in this country. Wouldn't you like to live on an Iowa farm, girls and boys?"

Iowa land, though not flat, is so generally level that roads can go straight across country and cross each other

at right angles. Ruth declares that these roads make a checker board out of the map. A number of Iowa's neighboring states show the same feature. When explorers pushed beyond the Mississippi they missed the groves of fine trees which they had seen on the lands of Ohio, Indiana and Illinois. Instead, they found trees only along the banks of the water courses, as we can observe in many places to-day. These men went back and reported that the prairie soil was too poor to grow even trees. How mistaken some judgments can be!

Almost in the centre of Iowa is Des Moines, its capital, on a river of the same name which, fittingly enough, is the capital stream of the state. Des Moines River means "river of the monks" or French missionaries, who set out so resolutely to explore the wilderness and preach the gospel to wild men. The "missionary river" leads us down past stately wooded shores until the Mississippi again meets our view. "Hurrah for the Father of Waters," shout Fred and Jack. "Come on for a trip upstream!"

QUESTIONS AND SUGGESTIONS

1. What other important work did Captain Eads complete?
2. Show by a sketch the states which possess parts of the Ozarks.
3. What twin cities have we found in our travels?
4. In Part Two of *The Magnificent Adventure*, by Emerson Hough, read of Lewis and Clark's wonderful journey.

CHAPTER XXXII

UP THE MISSISSIPPI AGAIN

A Chief and a Power Site.—At the mouth of the Des Moines River is the city of Keokuk, named for an Indian chief, whose name meant Watchful Fox. When Black Hawk took up arms against the settlers and Abraham Lincoln was one of the Illinois troops who rallied to defend their homes, Keokuk kept his tribe quiet. So famous did the chief become that he was asked to speak in many eastern cities. At last the vengeance of Black Hawk's defeated warriors reached Keokuk, and he died of poison; but his services are not forgotten, and a park surrounds his grave in Keokuk city.

In the old days this part of the Mississippi was hard to pass, for rivermen had to struggle with miles upon miles of the foaming Des Moines rapids. The boatmen rejoiced when a canal eight miles long enabled them to avoid the rapids; now, however, they would not know the spot, for both the old canal and the old rapids are gone, buried under the lake formed back of an immense dam.

On the Iowa end of the dam stands a big power house, where the water strikes the blades of turbine wheels and produces electricity. In St. Louis, about one hundred and forty miles away, the street cars run by Keokuk power, and many a factory and electric light plant receives the benefit of this harnessed water. It is the greatest power development of the Middle West. A new canal has replaced the old. Its lock lifts up and up the vessel on which we have taken passage, and we glide out forty feet higher, into a lake as long as Keokuk is distant from St. Louis.

The New-Alex Dam. This will discharge across the river is nearly a mile long. The immense power-house is at the left. What is done with the power?



Triplets and Buttons.—At the upper end of this lake is a group of three cities, Davenport on the Iowa bank, Moline and Rock Island in Illinois. Together they would make a community as large as Fall River, Trenton, or Nashville. One of their chief industries is the making of farm tools and machinery, and their plows are especially famous. Rock Island is in very truth founded on an island of rock, the only one of the many Mississippi islets, from the south up to this point, that is not made entirely of loose soil. An important railroad leads from Chicago to this point and is known as the Rock Island Road.

Along the water's edge above this point the boys notice many fishermen. "No, they are not trying to catch fish," says one of the passengers, "they are after those dark shelled fresh water clams called mussels, the same that give their name to Mussel or Muscle Shoals. A man of foreign birth picked up a mussel shell from the sand of the Iowa shore. He was about to throw it back into the water when he noticed that it was like the shells which he had handled as a boy button maker in Europe."

From the thought, experiment, and invention of that man a large industry has risen. The pearl buttons on clothing are made from the glistening mussel shells, and some shells even are imported from across the sea. The fishermen, as they work, hope not only to get a good load of shells for the nearby button factories, but perhaps also to find a big pearl, worth fifty, a hundred, or even a thousand dollars. One such pearl, brought twenty-five hundred dollars to the lucky man. "When I get home I am going to open a lot of mussel shells," declares Fred.

What St. Anthony's Falls Did.—Continuing our trip, we pass the mouth of the Wisconsin River, where Father Marquette first saw the Mississippi. So delighted was he by the many islands and the tall bluffs that he said, "I could not

express my joy." Steamboats are almost as rare today upon the clear current of the Upper Mississippi as are Indian canoes. Our vessel, however, continues her course up the narrowing stream until we pass into Minnesota and see before us the buildings of St. Paul.

Being nearly opposite the mouth of the Minnesota River, and at the foot of long rapids which fixed the head of navigation, it was natural that a settlement should grow up at this spot. A trading post and a fort brought people to the place. For a time the village rejoiced in the title of "Pig's Eye," and a lake within the limits of St. Paul bears that name at present, but a French priest erected a little church in honor of St. Paul, and St. Paul the growing community became. It is now the state capital and a very beautiful city, as large as Louisville.

At the head of the rapids which stop navigation are the Falls of St. Anthony, about twenty feet high. Before St. Paul grew around its fort, a saw mill, the first manufacturing establishment in Minnesota, began to use the rushing water of the falls. When settlers began to raise wheat, the sawmill was turned into a flour mill. This change tells the history of great Minneapolis. "Minnesota's city," as its Greek name declares, has grown up at the Falls; it now is half as large again as St. Paul, and counts as many people as New Orleans.

The Flour City.—While the forests of Minnesota make Minneapolis a great lumber city, timber has been overshadowed by wheat. To the westward stretch the greatest wheat lands of our country, and floods of golden grain pour into Minnesota's chief city. More than fifty elevators take wheat from the incoming cars and lift it to their high upper stories, from which it goes into bins until needed, each kind and quality of wheat in a separate bin.

"The big flour mills on the river bank seem to be calling for wheat," remarks Ruth. Let's hurry up and find father's friend, Mr. Wood. He'll show us how they make flour." Soon, by Mr. Wood's favor, we see the wheat sliding from the elevator into a car, then being picked up again and raised to the top of the flour mill. As it "shoots the chutes," this time it passes cleaning machines, then wide



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Some of the flour mills in Minneapolis. Here is the largest flour manufacturing company in the world. Why are these mills, operated by steam, situated along the Mississippi River?

steel rollers receive it and crush the grain into small pieces. These pieces are sifted through silk "bolting cloth," whose threads are so tightly made that the dust cannot catch on them and clog up the tiny spaces between them.

Again and again steel rollers crush the wheat, each time the rollers being a little nearer together. After each crushing the flour is "bolted" through finer and finer cloth until it comes out fine and white from a spout on the mill's lowest floor. Here a machine fills barrels or bags with the

white powder which makes our bread. No man's hand has touched the wheat from the time it was planted in the field. "Some experts say that we like our bread and our flour too white, and that we are wasting the best part of the wholesome wheat," says Mr. Wood. "Perhaps we shall all eat brown bread some day."

Minneapolis is the greatest flour city of the world. Although it borrowed the "roller process" idea of making flour from a Hungarian city far across the sea, it has improved on the foreign ways. Now the mills cluster so closely along the Mississippi that new buildings find it hard to get room, and the Minneapolis flour companies are actually building mills in Buffalo. At the Falls of St. Anthony, however, is the largest single flour mill in existence.

The "Flour City" is a good place to live in. A chain of lakes lies within the city limits, and a beautiful boulevard borders the lakes and unites most of the fifty parks of which Minneapolis boasts. Lake Minnetonka, larger than any of the chain, is not far away and forms a fine summer resort. St. Paul and Minneapolis, whose business centres are only a few miles apart, have grown until they touch each other. For most purposes they might as well be one city, and as one prospers it does good to the other. The "Twin Cities" show what wealth our farms and forests produce.

QUESTIONS AND SUGGESTIONS

1. Where is a greater power development than at Keokuk?
2. What other Middle West towns are famous for making farming tools and farm machinery?
3. Of what materials are the buttons on your clothes made?
4. Name three cities, beside St. Paul, which stand at the head of navigation.

CHAPTER XXXIII

THE KINGDOM OF WHEAT

A Vanished Lake.—Wouldn't you like to go to the source of the flood of wheat which pours into Minneapolis? Very well, then, we shall go out into the wheat fields and see for ourselves how this "staff of life" is obtained. From the Twin Cities we follow the Minnesota River up past cliffs and rapids. On the prairies back from the stream are thousands and thousands of wheat farms.

The river leads us to some lakes of considerable size; north of these we come into the valley of the Red River. Here is one of the most magnificent homes of King Wheat. This river is called the Red River of the North, to distinguish it from the Red River which we have met in Louisiana. Once upon a time an ice sheet blocked the flow of the river toward Hudson Bay, and made it spread out into a great lake, larger than all the Great Lakes put together are now. We can still see the marks where this lake washed its shores. The scientists have given to this ancient lake the name of Agassiz, after the famous Swiss whose story we have heard.

Lake Agassiz vanished long ago when the Red River finally cut through the dam made by the ice sheet, but the rich soil which dropped to the lake bottom remained. This valley, fifty miles wide, is shared by Minnesota and North Dakota (for the Red River is their common boundary line), and extends on into Canada. The soil is deep as well as rich; as it is washed into the river it gives to the water a reddish brown color from which the stream took its name.

Fall or Winter?—Alice asks a farmer in the valley to tell us why it is such a wheat centre, and this is the account he gives:

“Both soil and climate suit the growing of wheat right here. If this grain is to grow well it must have rich soil; but the best soil in the world would not be enough unless the weather conditions were favorable. Wheat needs cool nights and considerable rain while its stalks are growing, yet when the heads of grain begin to fill out and harden, there must be dry sunshiny weather.

“In going away from the Atlantic or the Gulf of Mexico toward the Rocky Mountains, you may have noticed that the amount of rain grows less. This Red River Valley has only about half as much rain during the year as Pennsylvania or Ohio, but fortunately the rain comes in the spring and early summer, so that wheat can grow well. Then as the wheat ripens, dry weather for harvesting sets in, and everybody is happy.”

In the Eastern States and in the Corn Belt, wheat is usually planted in the fall. It springs up, covers the field with a green carpet, and is several inches high before cold weather arrives. Then it goes to sleep, and when spring awakens it the wheat has already made such a good start in growing that much time is saved. If a blanket of snow has kept it warm during the winter, so much the better.

Up in Minnesota, the two Dakotas, and Montana the winters are so cold that the wheat plants would be killed in the ground by Jack Frost; so the farmers cannot plant winter wheat, but they put their wheat into the soil when the mild spring days arrive. On account of the long days of sunshine this “spring wheat” pushes along faster than in the states southward, and its harvest comes not many weeks later than that of winter wheat.

Wheat Belt and Wheat Ranch.—There is a great belt of wheat farms extending south through the United States from the Canadian line. Minnesota, North Dakota, Montana, and South Dakota, as we have seen, are the chief spring wheat

states, but below these are Nebraska, Kansas, Colorado and Oklahoma. The great Wheat Belt thus takes in parts of eight states. True, the good farming state of Pennsylvania raises as much wheat as Colorado, and the Corn Belt sisters, Ohio, Indiana, Illinois, and Missouri, are great wheat growers; but there are so many kinds of "diversified farming"



The gang-plow, a labor-saving device. How many plows can you count in this picture? This tractor is doing the work of how many horses?

in these last five states that wheat is only a small part of their yearly production.

It is no use to try walking over our friend's Red River wheat "ranch," for it covers many hundred acres, and is a waving sea of golden heads. Last spring, a gasoline tractor pulled a set or "gang" of plows through the soil, in which scarcely a stone could be found. How different from the rocky land of New England! Harrows with sharp steel wheels or "disks" followed the plows, and soon the soil was made fine and soft. Next the "drill" went across the field, dropping the chubby seeds into the waiting earth. So close together are the rows of wheat when they grow

that few weeds can live, and the wheat field does not need to be "cultivated" like a corn field.

Now four months have passed since the planting, and harvest has come. This is the busiest time in the year. To and fro through the level yellow fields go the reaping and binding machines, cutting off the wheat stalks and tying them with twine into sheaves. Isn't it wonderful, Jack, to think of a machine that can tie a knot faster and tighter than you can? Jack watches its work so closely that Fred says, laughing, "Ho, ho! Do you expect the binder to teach you how it's done?"

After the sheaves are ready the big threshing machine arrives. Men open the sheaves and toss them into the mouth of the thresher. There is much noise and much dust; then out of a spout comes pouring such a stream of grain that it soon fills the bags placed under the spout. The straw and chaff are blown some distance away out of a long pipe and form great heaps.

From Low to High.—"What will you do with these thousands of bags of wheat?" we ask our farmer friend. "Now the wheat will go to the grain elevator at the nearest station," he says. "There it will be stored until I can get a fair price for it; then it will form part of the immense stream of grain which flows away from this wheat belt. Perhaps it will go to Minneapolis and be crushed into flour. Perhaps it will be sent to Duluth, there to slide into the hold of some lake steamer, and take its way onward to Buffalo. Perhaps it will even help to feed the people of Europe."

"In the old days," continues our friend, "the millers considered this spring wheat which I raise almost useless. They were all accustomed to winter wheat, which is rather soft, whereas the kernels of spring wheat are hard and have a flinty husk. When spring wheat was ground between the old-fashioned millstones, the hard husk broke up into

a great many little brown particles. These particles of "bran" were so small that they could not be sifted out of the flour; consequently the flour had a dark appearance, which buyers did not like. The softer husk of the winter wheat did not break up into such small pieces, and could be 'bolted' out, leaving the flour white. 'Spring wheat is poor wheat,' said the old-time millers. 'We don't want it.' "

Along came the new "roller process," which crushed the grain instead of grinding it. Although the husk was torn it stayed in one piece, and could be easily removed, making the flour whiter than any American flour had ever been. No millstones can grind wheat into such a fine powder as that which comes from between the steel rollers. Now the bread makers say, "No wheat is so good as spring wheat for making light loaves." For pies and cakes, however, they prefer "pastry flour," which comes from winter wheat and gives a closer, heavier mixture.

"Why is your spring wheat so hard?" inquires Fred. "Well, in it there is a great deal of stuff called gluten, which makes us think of the word 'glue.' Gluten is hard and even splintery when dry, but very, very sticky when it is moist and hot. When your mother makes bread, she moistens the flour, mixes it with yeast, and works it up into dough, then 'sets' it in a warm place. The yeast ferments and makes gas, which tries to get out, but is held in place by the sticky dough."

"The harder the wheat, the more gluten; and the more gluten, the more the bread 'rises.' Now you see why our hard wheat flour brings the highest prices, for it makes fine light bread. We have one kind of wheat which is so very, very hard that it is called 'durum,' from the Latin 'dur' meaning hard. This wheat is used to make macaroni and spaghetti, which our Italian friends love so dearly."

A Southward Run. The Blanket Men.—Taking leave of our good Dakota friend we travel southward through the Wheat Belt. Our route leads from North Dakota to South Dakota, then onward to Nebraska. Still we continue to Wichita, Kansas, and on into familiar Oklahoma and Texas. As soon as we come into Nebraska the farmers tell us that we have entered the region of milder climate where winter



Wheat and corn side by side in Minnesota. This state, which was once devoted so greatly to wheat, is now coming into the list of corn states. Why?

wheat grows. Kansas, however, lying south of Nebraska, seems to be just right for winter wheat, and is the greatest wheat state of our Union.

What an army of laborers is needed to gather this enormous crop of the Wheat Belt! The wheat of one place must all be gathered, moreover, within a few weeks, or it will become so ripe as to "shatter" out and be lost on the ground. The wheat farmers cannot employ throughout the year anything like the number of men which they need at harvest time. Fortunately they are helped by thousands

of men who form a "floating army" which sweeps northward through the ripening fields as the season advances.

In June these workers hire out to the Texas wheat farmers; when those one and one-half million acres have been harvested, the "blanket men" pick up their scanty baggage and move on to Oklahoma. By September they are perspiring on the plains of the Red River Valley. When the mighty crop has all been gathered, the army melts away to various occupations, until the glowing sun of the next year casts its yellow hue again over the American wheat fields.

QUESTIONS AND SUGGESTIONS

1. What is the best place for raising a field of wheat?
2. How can cold snow keep people or things warm?
3. Sketch a map of the Wheat Belt. Are any of the Corn Belt states in the Wheat Belt?
4. How is the big Red River wheat ranch different from the wheat farms you know?
5. What kind of flour does your mother use? Where does it come from?

CHAPTER XXXIV

THE LAND OF UNCERTAIN RAIN

From Prairie to Plain.—Let us go westward by the Atchison, Topeka and Santa Fé Railroad from the wheat Belt of central Kansas, following the course of the Arkansas River. Our train goes uphill by a small but steady slope. By the time we travel two hundred miles we climb two thousand feet. As we pass farther up the river it seems to lose water. In places we see hardly anything but dry sand in its channel. What is the reason? Shall we ask that sunburned man who seems to be so familiar with the country?

“You are passing from a region of moderate rain into a region where rainfall is uncertain,” says our new friend. “You are leaving the prairies and entering the Great Plains or High Plains. These, we may say, lie in the shelter of the Rocky Mountains, a thousand miles from the Pacific Ocean, and the winds that visit them don’t carry much moisture.

“While the prairies naturally have few trees, the farmers do not have much trouble in raising fine groves to shade and protect from gales their barns and houses, but on the High Plains trees will hardly grow at all except on the banks of water courses. Sometimes on the plains, there will pour down a torrent of rain, a ‘cloud burst,’ filling the dry beds of streams with a wall of water, drowning animals or perhaps men. At other times the people of the plains may wait a long time for refreshing showers.”

Dry Farming.—“How does farming prosper in this land of uncertain rain?” we ask. “It’s rather mixed,” is the answer. “In many places special kinds of wheat will grow, for wheat is a plant which may produce a crop almost on

the edge of a desert. In other places the farmer may raise Kafir corn, which will feed his farm animals. In some locations he irrigates, putting a supply of water on ground which would otherwise be parched.

"Again, the farmer may practice dry farming. What is that, do you say? Why, it is a way of making the moisture of the ground go a long way. Some wise farmers noticed that in drying out, the ground became full of cracks and holes, through which the land breathed out its moisture and lost it. 'Let us put stoppers in these holes,' they said, so after each shower they went into the field and harrowed the surface until it was dry and dusty.

"This dust blanket prevented the moisture from finding passages through which it could escape, just as a blanket keeps you warm by preventing the heat of your body from escaping. Instead of being wasted into the air, the moisture of the soil was kept underground for the use of the roots of the grain. There are a number of ways of dry farming, but the foundation of all of them is the conservation or keeping in of moisture, and wheat, which doesn't need a great deal of moisture, anyway, after it gets well started, is a great dry farming crop."

The Cattle Kings.—In these Great Plains, however, stretching away in a wide belt a thousand miles long at the foot of the Rockies, a great deal of the farming is somewhat of a gamble at its best. The crop of an entire year may dry up and come to nothing. Many a Montana wheat raiser is satisfied if he gets a fair crop one year out of three. In the early days many a "homesteader" who tried his luck at farming the plains deserted his house and his land and went back, disappointed, to a region where rain was frequent. The open spaces were left for the cattle kings.

Today Western farmers have learned much better how to use the scanty rainfall, but the Great Plains are still a cattle

region. In a grass field of the Eastern states you will have to look very sharply in order to see any ground at all, for it is covered and shaded by blades of grass growing thickly and with roots woven together into a tough sod. The plains which we now see from our car window remind our party of what we saw in the Panhandle of Texas. There is no sod, but tufts of "bunch-grass" grow here and there, with bare ground between them. The Eastern farmer might be



Cowboys of South Dakota. Pickett Butte is in the background. Find the cattle near the base of the butte. Why would you think this country was rather dry?

able to pasture ten cows on ten acres of land; on the Great Plains at least ten times as much land would probably be needed. "I think it's fun to own a lot of land," says Ruth, "even if you don't get so much from it." "But what's the use of bothering with so much land if you don't have to?" answers Fred.

On the wide stretches of "free range" or Government land, the old-time cattle rancher scattered his herds for many miles. Wherever a "water hole" was found, it

afforded a centre for stock raising. Some of the "cattle kings" bought great domains and use much more by right of being the first to do so. They commanded troops of hard-riding cowboys, who braved heat and cold, exposure and hunger for their employers. At certain times the cowboys "rounded up" and counted the far-ranging, half-wild



A round-up in New Mexico. Notice the cowboy in the foreground. What will be his duties in the round-up?

cattle; the little calves were branded with the owner's mark and turned loose again with their mothers, while some of the best cattle were driven to the nearest railroad and shipped to a slaughtering point.

Change and Coöperation.—Many of the immense cattle ranches have now disappeared. In their place have come farms where the once despised "homesteader" tills the soil. Other ranches have been cut up into smaller divisions, which

are enclosed by wire. The new owners of these divisions count their cattle by hundreds instead of thousands. As the cattle of various herds do not mingle, branding is not necessary, and as they can't stray far away, not so many cowboys are needed.

The precious "water hole" of former years is replaced by the windmill, which by the force of the strong Plains breeze pumps up a good supply of water for the thirsty herd. When a sudden "norther" sends its chilling, freezing breath over the Plains, the cattle hasten to shelter under sheds which are provided. When snow covers the grass, the cattle do not starve as in old days, but are fed with nourishing alfalfa hay. Thus, the loss of cattle, once so great, is avoided.

In spite of the shelter, water and food which are now provided on the small cattle ranches, the cattle which feed mostly on bunch grass never grow fat. Bone and muscle are the result of their out-door life, but their meat undoubtedly has a likeness to rubber. To the east, however, lies the Corn Belt, with plenty of good grass and good corn. The ranchman, therefore, sells his athletic cattle by the carload to the Corn Belt farmer, who keeps them a few months, sets good meals before them, doesn't let them exercise too much, and then sends these "feeders," fat and tender, to the slaughter house.

The Plains serve, therefore, as a cheap place for raising cattle, but not for fattening them. The Corn Belt farmer perhaps cannot afford to waste his time raising cattle, but he can make good profits by fattening the cattle which are already raised. The belt which specializes in cattle raising reaches from Texas, the greatest cattle state, northward through Oklahoma, Colorado, Kansas, Nebraska, South Dakota and Montana, while in the Corn Belt, Iowa, Missouri

and Illinois are the great feeding states. Thus, one region coöperates with the other in putting good, tender beef upon our tables.

QUESTIONS AND SUGGESTIONS

1. On a rainfall map of the United States, find the line which separates the ordinary farming region from the dry-farming region.
2. What crops cannot be raised by dry-farming?
3. What kind of land in the Eastern States would not have good sod for pasture?
4. Why does a cowboy wear a broad hat, a handkerchief round his neck, leather cuffs, leather leggings and high-heeled boots?
5. How do the cattle-belt and the corn-belt work together?

CHAPTER XXXV

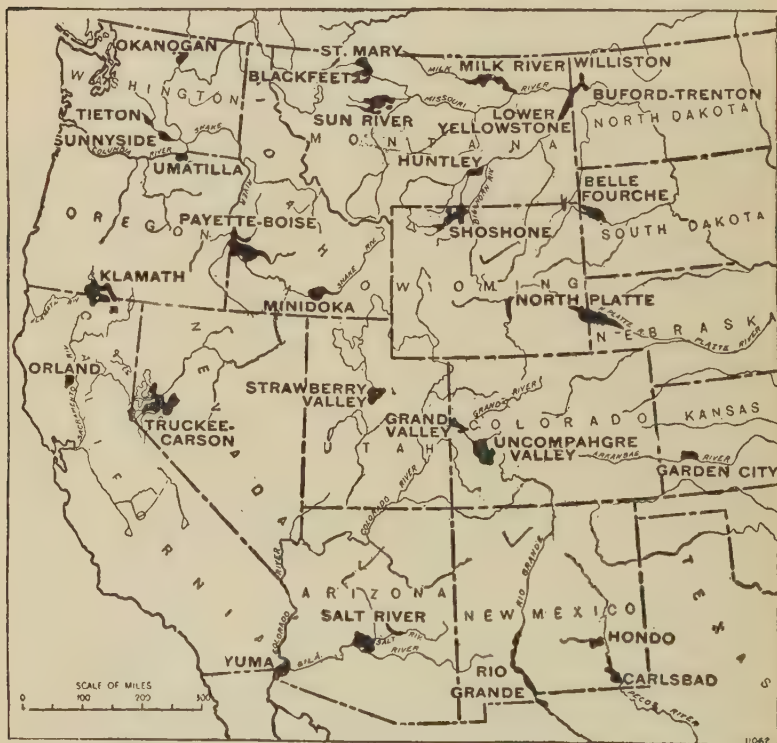
CONQUERING THE DRYLANDS

Green Fields.—We are still traveling up the Arkansas River. North and south of the river are brown cattle ranches and yellow wheat fields, but in the wide river valley green is the prevailing color. At the stations we see crates of truck and cases of canned peas and tomatoes ready to be shipped away. Groups of contented dairy cows graze in enclosures. Here are beet sugar factories, lording it over their thousands of acres of surrounding fields.

Our train stops at the station of Rocky Ford. "This is Melon Day," says a fellow passenger. "Here canteloupes and watermelons grow to perfection. There will be great piles of both these fruits, free to all, just to show what Colorado can produce." Jack wants us to stop and try the melons, but our time will not permit, so we excuse ourselves with thanks.

The Secret of the Fields.—"Please tell me what's the secret of all this production in the heart of a dry country," asks Alice, as she looks at the green fields. "Irrigation is the answer," replies the friendly passenger. "We are nearing the Rocky Mountains, where, near the centre of Colorado, the Arkansas is born. The rains which fall upon the mountain slopes, and the melting snows of the high peaks, gathered into the Arkansas waters, come flowing out of the highlands. As soon as they reach the plains they are distributed into canals, some of which are more than a hundred miles long.

"From the main canals branch smaller ones, and these in turn lead into good-sized ditches, which supply the farmer's fields. The owner of the field must see that it is



The principal irrigation government projects of the West. Which states have more than one project? Which state has most of all?

carefully leveled, and that it is provided with little ditches so that each part can receive its share of the life-giving water. He pays a certain amount for the water he takes, but is allowed only a certain share. "Ditch riders" travel along the waterways to oversee the distributing of the flow.

" Within the field, a piece of canvas stretched across the ditch or a little wall of earth thrown up with a shovel, turns the water from one passage to another as the farmer desires.



Photo by Ruth Huber.

Irrigation canal.

One week one part of his land gets the benefit; the next time he is allowed to have water he diverts it to another portion of the land. Even farmers on the flat surface of the plain above the river valley partake of the gift of water,

for pumps raise it to a high level ; then it flows down twenty miles or more away from the Arkansas itself."

Safe Farming.— "Oh, is that the way they do it?" asks Fred. "Then I suppose the farmer feels pretty safe as long as he can get water." "Yes," continues our friend, "in the sunshine and the clear plains air, with very little rain to delay his farming operations, the worker on irrigated land can go steadily and surely about his business of raising crops. What a blessing is irrigation! By its use, millions of acres throughout the Western States are producing grain, vegetables, and fruit, or feeding dairy cows, whereas without water they would be barren wastes or at best the homes of scattered herds of beef cattle. The total amount of irrigated land in this country would make a district almost as large as Kentucky."

"Because the farmer of irrigated land can receive only a certain amount of water, and because the care of such land demands a great deal of time and labor, the irrigated farms are usually very small compared with cattle ranches, wheat farms, or even with those of the Corn Belt. While the farmer puts much labor on his small farm, he receives from it a large value. The wheat raiser of North Dakota may sell his crop for twelve or fifteen dollars an acre, but the truck raiser of Colorado will probably be receiving ten times as much an acre for his crop. The greatest crop on irrigated land, however is not truck but alfalfa, which will produce three or four crops a year and is fine food for cattle. Thus the irrigated farms in the Plains can fatten the cattle which are raised cheaply in the dry lands around.

"Because the irrigated farms are usually small, and adjoin each other, many people live in the irrigated regions, and their homes are near together. These neighbors gather into villages and towns ; they have good schools and churches ;

they find it easy to visit back and forth. Man's intelligence has overcome the dryness which scattered settlers over the plains; irrigation has brought settlers together and made real neighbors of them." "Thank you, sir," says Fred, politely. "You've been a very good instructor."

Where is the American Desert?—When Andrew Jackson was President, the maps which school children studied showed in big black letters beyond the Mississippi and near the Rockies, "Great American Desert." This was supposed to be useless for settlement, and good only for buffaloes and Indians. Now, even if we consider nothing but meat and grain, it has become a useful part of our country. With irrigation, its possibilities are enormously increased.

Today, along the eastward base of the Rockies, the rivers which flow out on the Plains are used until they almost run dry. For two hundred and fifty miles along the Arkansas irrigation commands a rich return. Northward, the waters of the South Platte irrigate the country about Denver, and the North Platte bestows its blessing upon the Cheyenne District in Wyoming and Nebraska. In South Dakota is the Belle Fourche (Bell Foorsh) irrigation district, and the vast plains in Montana are watered by using the Yellowstone and the Missouri.

Uncle Sam has spent vast sums of money on various irrigation projects, but there are also many irrigation companies who make well-deserved profits from the water which they store and sell. The "Great American Desert" has retreated from the Plains and now hides itself away within the Rocky Mountain Highland. Though there are still immense stretches of land in the United States which are really desert, and which can never be irrigated, there is much water available within the Rockies, and we shall see, as we travel on, many more prosperous and smiling irrigated districts.

QUESTIONS AND SUGGESTIONS

1. Why is it extremely hard to find the true source of a river?
2. Imagine that you are a ditch-rider. How would you arrange matters so that every farmer would get his proper share of water?
3. What other farming beside irrigation-farming is intensive, as compared with the raising of wheat or corn?
4. Would you prefer to live on a Western irrigation project or in the Cotton Belt? Why?
5. Sketch a map of the Arkansas River from its source to Wichita, Kansas, showing the states concerned. Print along the river valley, at the proper places, the names of crops raised there by irrigation.

CHAPTER XXXVI

TO THE TOP OF PIKE'S PEAK

The Pittsburgh of the West.—Where the irrigated Arkansas Valley begins to be embraced by the Rocky Mountains, we come to Pueblo, the "Pittsburgh of the West." Pueblo in Spanish means "town" or "village," and we shall hear this word again. Some Mexicans began here a small settlement, their "pueblo," farmed the rich soil and dug rude irrigation ditches; but the Indians troubled them and the whites invaded their territory until they were glad to return southward.

Gold was discovered in Colorado, a railroad came, large coal fields were explored—now Pueblo is larger than Galveston and is the trade centre of the southern part of the state. Ores of the Rockies come to Pueblo for smelting; bars of gold and silver, and much pig iron and steel are the result. It is Pueblo that makes Colorado the greatest iron state of the West. Great ovens turn coal into coke for Pueblo's smelters. The Arkansas Valley and the Plains ranches supply animals for her stockyards. North, east, south, and west, in a sort of cross, run the railroads which bring supplies to Pueblo and take away her products.

Driving to Colorado Springs.—We go north from Pueblo, preferring to drive, for on our left spreads out the marvelous wall of the Rockies, crossing the whole width of the United States. "Well, old Rockies," says Jack, as we start gayly off, "I'm surely glad to make your acquaintance." This great belt of mountains, range behind range, forms the edge of an enormous highland which takes up almost the entire western part of our country, and covers one-third of its

OUR OWN UNITED STATES



extent. Within them is the Continental Divide, where on one side waters flow toward the Gulf of Mexico and on into the Atlantic, while on the other side the water of the streams finally reaches the Pacific.

In less than two hours our car arrives at Colorado Springs, called the "City of Sunshine," for the weather is clear three-fourths of the time. There are no fogs, and the air is so dry that this city is a famous health resort, where many wealthy men have built handsome homes. The Rockies rise up only a few miles away to overlook the town, and cool breezes blow from their slopes. Fine parks make ribbons of beauty around the city.

Two Famous Parks.—Surely we should visit a couple of these parks. Let's take a trolley car to the entrance of the park in South Cheyenne Canyon. The road rises gently but surely to the base of Cheyenne Mountain; we begin to ascend the canyon along a creek. Finally a waterfall appears. We climb a flight of steps near this fall, reach a platform, and lo! there is another fall above. Up and up we go, forgetting to be tired, one stairway after another, each alongside its lovely cascade, until we have mounted more than three hundred steps and have counted seven falls.

Our path leads us to the mountain crest, where we may look out over the ocean-like plains and see Colorado Springs shining far below. Here Helen Hunt Jackson came day after day to gain inspiration from the view, and here she wrote "Ramona," a story of California, designed to make Americans feel more sympathy for the Indians.

Another electric road from Colorado Springs conducts us to the Garden of the Gods, a park about a mile square, owned by the city. Here are rock formations of red and white sandstone, carved by frost, wind and rain into fantastic shapes. The gateway to the garden is made by two immense

upright masses of bright red rock, between which the road passes. In front of these, which act as sounding boards, a college holds its annual play. We admire the tall Cathedral Spires, are amused by the life-like polar bear which is about to



Gateway to the Garden of the Gods. The cliffs which form the gateway are of deep-red sandstone, which is easily worn into strange shapes. In the background is Pike's Peak.

pounce upon a seal, and see many another strange shape in stone.

Pike and His Peak.—The same electric road by which we reach the garden leads us to the village of Manitou, which nestles so closely at the base of Pike's Peak, the most famous mountain of Colorado, that by three o'clock in the afternoon the shadows have overflowed it. Here are hot springs, which the Indians believed were made hot by Manitou, the Great

Spirit, who lived on Pike's Peak. The Peak stands tallest in the Front Range of the Rockies, and is often called "The Sentinel of the Plains."

Two years after Lewis and Clark had set out from St.



Pike's Peak. Does "peak" seem a good name for it? Notice how bare the surrounding country appears, even near the stream.

Louis on their famous expedition, Lieutenant Zebulon Pike, young and fearless like them, led forth from the same point a somewhat smaller exploring party. He was to bring back knowledge of the country along the southwestern boundary of that great territory called Louisiana, which Jefferson had

bought for the growing United States. Finally, at the end of November, Pike came to the spot where now stands the City of Pueblo.

Leaving most of his men at that point, Pike ascended a stream which brought him, in a heavy snowstorm, within view of an outstanding "high peak." The four men of Pike's party began a climb which they thought would lead them to the summit of this peak, but at last they gave up the attempt in despair. "I believe no human being could have ascended its pinnacle," said Pike. "Its height is so remarkable as to be known by all the savage nations for hundreds of miles around."

Fifteen years later some members of Major Long's scientific party did reach the top of this peak, although Pike had declared it impossible to do this, and his name was at last given to the mountain. Today we may take a cog road, like that of Mount Washington, to the summit, or we may drive up by a fine and safe automobile highway. We prefer the drive of twenty-eight miles from Colorado Springs, through Ute Pass and a national forest, named after Pike. The beginning of the real climb from Ute Pass is so far above sea level that it overtops Mount Washington.

To the Summit.—Around hairpin curves purrs the car. "Oh, oh!" cries Alice, looking down into the "Bottomless Pit," "I'm glad that the edge of the road is protected just here by a wall!" Now we are above timber line; even the last stunted and twisted pines have disappeared, and nothing but bare rock remains. Blasts of cold wind whistle past our ears, and a sudden snow storm covers us with flakes, but up we go. A cloud envelops the road in fog, and we must stop the car and put stones under the wheels so that we may proceed in safety when the "clouds roll by."

The cloud passes, and we reach the top—a patch of boulders, cracked and broken by the winter frost. So thin is

the air that our hearts beat fast as though we had been running a race. Fred has a touch of "mountain sickness." His face takes on a greenish look, he breaks out into a cold perspiration and seems to lose his strength. Many people are affected in this way when they go up to a height of thirteen thousand feet above sea level, and we are a thousand feet higher than that. We enter the low stone Summit House and warm ourselves a bit; then Fred feels better.

Once more outside, we look from our platform, well on to three miles above the sea, over a region larger than the State of New York, plains to the east, and westward a wild confusion of mountains. It seems as though we were on the top of the world, and yet Colorado is at such an altitude that she boasts of more than twenty peaks higher than this of Pike's. Perhaps it is hardly fair to say that, however, for they are only slightly higher than Pike's Peak, and even the highest mountain in the United States, outside of Alaska, surpasses Pike's by only eight hundred feet, or about the height of New York's tallest building. Even by cold figures our Peak is still imposing.

QUESTIONS AND SUGGESTIONS

1. What Spanish names can you find on the map? In what part of our country are Spanish names most frequent?
2. Sketch the line of the Continental Divide, showing five rivers which flow east from it and two rivers which flow west.
3. What climate does a city need in order to be a good health resort? Name two other cities beside Colorado Springs which are famous health resorts.
4. *A Volunteer With Pike*, by Robert Ames Bennet, tells how John Robinson and Lieutenant Pike tried to ascend the "Grand Peak." Find out what hardships they encountered.

CHAPTER XXXVII

THE EDGE OF THE ROCKIES

Queen of the Plains.—Our way from Colorado Springs leads us northward. Two hours in the train, and then we are in Denver, Queen of the Plains. Like Pueblo, Denver stands at the foot of the Rockies, and is a gateway between plain and mountain, but it is six times the size of Pueblo, and much larger than any city in the Western mountains. "What makes Denver a queen?" Ruth would like to know. Why, Colorado's wonderful mines keep Denver's smelters busy and call for the machinery that Denver makes, while the wheat and cattle of the plains supply her flour mills and many stockyards.

Denver was settled because of the gold rush to Colorado, about ten years after the great gold rush to California. Many a covered wagon or "prairie schooner" crawled across the plains bearing the sign, "Pike's Peak or Bust"; while some immigrants went back "busted," the greater number remained. At that time Kansas extended all the way to the Rockies; so the new town which became a centre for the gold miners was called by the name of Governor Denver of Kansas.

Irrigation from the South Platte gives Denver green garden patches and shaded streets. We go up to the capitol building and from it look at the long line of mountains presented to our view. To the south, seventy-five miles away, is giant Pike's Peak, and a hundred miles to the north is its brother, Long's Peak.

Rocky Mountain National Park.—Around Long's Peak is the Rocky Mountain National Park. A train ride as short

as that which we took from Colorado Springs to Denver, but in a northwesterly direction, brings us to the little valley town of Estes Park, with many hotels. Here we make our headquarters while day by day we take excursions into the mountains.

Lord Dunraven, an Englishman who loved outdoor life, came to this region every year to shoot its bear and mountain sheep. No other part of the world appealed so much to him. He bought the land on which stands Estes Park; he brought an artist to put its beauties on canvas, and persuaded a travel writer to describe it for the benefit of nature lovers. Later, Enos Mills the naturalist made his home at the foot of Long's Peak, wrote delightful books about the animal and plant life, and worked for many years to have the region made into a national park. He lived to see his efforts crowned with success.

This park bestrides the Continental Divide, or "Snowy Mountains." The visitor to Estes Park Village is eight thousand feet above sea level, while the Continental Divide Mountains rise a mile higher on the average, and are plentifully dotted with snow fields all summer long. Sometimes we employ ourselves watching the beavers building dams in the valleys, or studying the thousand kinds of wild flowers which give color to the hillsides. Sometimes we spend our time visiting the small glaciers or ice rivers which still exist, or tracing the work of the enormous glaciers of times before man appeared upon the earth. Whatever be our occupation, we find it delightful.

Natural Parks, "Go West."—Within the Colorado mountains lie some parks which are not national but natural. They are not parks because they have been laid out or planted by man as a playground. Between the north and south ranges of the mountains are ranges running east and west,

thus forming valleys enclosed by stony walls. These are the "parks," South Park, Middle Park, and North Park being most famous. Into them the rains have washed soil formed from the decay of the rocky slopes until they are very fertile. Some of the surface has been cultivated, but most of it is used for pasture. Many such high but fertile



A potato field near Greeley, Colorado. What part of your own state is best known for potatoes?

valleys are found throughout the eastern part of the western mountains.

Resuming our journey, we come to Greeley, on the plains east of the Front Range, which preserves the name of Horace Greeley, the famous newspaper owner and editor of New York. In the days after the Civil War Greeley came to Denver to see for himself the new kingdoms of the West. He went back warm with admiration of the country he had seen, and published long descriptions of the wealth waiting for settlers.

"Go West, young man," was Greeley's advice; he put one of his newspaper men at the head of a colony, and suc-

cessful Greeley, famous especially for its potatoes, is the result. Where days are sunny and nights are cool the potato finds its best home, and Colorado potatoes are as famous in this part of the United States as Maine potatoes are in the East, or as Michigan potatoes are in the Middle West.



Courtesy W. G. Scott.

In a national forest of the West. We have more than one hundred and fifty national forests in our country, and some day we must look to them for most of the lumber which we use.

Wyoming and the Black Hills.—We enter Wyoming and stop for a brief time at Cheyenne, which, though it is Wyoming's largest city, would seem very small in the densely settled states of the East. So mountainous is Wyoming, and so severe is her winter climate, that only Nevada is more thinly peopled. All the citizens of Wyoming would not equal in number the people of Atlanta. What a state for a person who loves the great outdoors, wide spaces and air

undimmed by factory smoke! Cattle raising is still an important industry there.

From Cheyenne we strike northward through the Plains, following the eastern boundary of Wyoming. After nearly two hundred miles across the brown expanse, Jack sees, straight before us, some dark heights rising directly from the flatness. These are the Black Hills, an outpost of the Rockies, not a range but a clump. Imagine a rough city wall fronting the ocean, with a peninsula stretching out into the waves. On the end of that peninsula picture a round castle. The city wall would be the Rockies, the castle would be the Black Hills, and the peninsula would represent a high neck of land which connects the two.

These Black Hills were so-called because of the dark pine forests which enfold their slopes. They cover an area larger than Connecticut, and one-third of that is still kept as a national forest. These hills, or rather mountains, have yielded rich stores of gold and other minerals, and their well-watered valleys are favorable to grazing.

Cody and the Great Dam.—Following Greeley's advice, we now strike westward, through valley and pass, beneath the shadows of mighty mountains, by the Chicago, Burlington and Quincy track, until we reach the Wyoming town of Cody. Here William Cody, or "Buffalo Bill," last of the famous frontiersmen, had his ranch, and here he organized his "Wild West Show" which delighted millions of people.

Near Cody is the great Shoshone Dam, built across the deep narrow canyon of the Shoshone River, more than three hundred feet high and more than a hundred feet thick at the base. "It holds one hundred and fifty billions of gallons of water for the benefit of the surrounding country," says a keen-eyed engineer who is measuring the water's flow. Yet this enormous construction is not the highest dam built by the Government, nor does it contain the most water. "We

fellows of the United States Reclamation Service," continues the engineer, "are always trying to surpass our own records in completing one magnificent project after another. No other government does so much for its people as does Uncle Sam's."

QUESTIONS AND SUGGESTIONS

1. Name three gateway cities besides Denver and Pueblo. Prove that the three which you name are gateways.
2. Read in *The White Desert*, by Courtney Ryley Cooper, why Barry Houston never got his car over Hazard Pass.
3. In Enos Mills' book, *Watched By Wild Animals*, read the chapters on "The Rocky Mountain Goat" and "The Bighorn In the Snow."
4. What work in shaping the earth's surface do glaciers perform?
5. Find out in reading *The Forester's Daughter*, by Hamlin Garland, how Norcross, the stranger, met Berrie McFarland of the Bear Tooth National Forest.
6. What work in shaping the earth's surface do glaciers perform?

CHAPTER XXXVIII

A MOUNTAIN WONDERLAND

Our Greatest National Park.—One day in the year 1807 a trapper named John Colter, trying to avoid hostile Indians, found himself in a new and strange region, so wonderful that when he returned to his friends they would not believe his stories. Just “John Colter’s lies,” said they. For sixty years after this time the few explorers who came into this western wonderland were not credited. Not until the Civil War was past did people realize that the headwaters of the Yellowstone River were in a region of marvels.

Now the Yellowstone National Park, the oldest and largest of our western national parks, occupies the northwestern corner of Wyoming. It is more than sixty miles long, more than fifty miles wide, and is almost as large as Rhode Island and Delaware put together. Over nine-tenths of it spread evergreen woods, and the park is nearly surrounded by national forests. Mountain and valley remain almost in their natural state, and so large is the park that visitors usually see but a small part of it. That part, however, takes in the greatest of its wonders.

A drive of about sixty miles from Cody brings us into the Park. Now it is for us to choose what we shall see. Here is an officer riding along a well built road. Let us ask him. “I command the forest rangers stationed here,” he says. “We are here to protect the wonderful park from being spoiled in any way, and I must also superintend the construction of new roads. I advise you to see the geysers first, for the park contains more geysers and greater geysers than all the rest of the world together.”

The Geysers.—The captain leads us to a valley whose floor seems strangely white. Look, have the rangers made a fountain to amuse visitors? From one of the low mounds which appear here and there rises a column of water, which



The Giant Geyser, Yellowstone Park. It spouts for an hour at a time, at intervals of one to two weeks. The mineral deposited from the hot water has formed a low mound about the pipe of the geyser.

shoots far up into the air with a roar, dances up and down for a brief time, then disappears. From it clouds of steam float away. "Can that fountain, out in the open, be hot water?" asks Alice, as she gazes at it.

That is just what it is. A geyser is a water volcano. Water trickling into the tube of a spring becomes hot from some heated rocks beneath the surface and would turn into steam if it were not kept down by cooler water above. After a while the steam pressure grows so powerful that it bursts upward, throwing the boiling water into the air. When the tube is completely empty the geyser rests until conditions are ready for it to spout again.

Underground Fires.—"Nearly seventy-five of these strange geysers are found in the Park," explains the captain. "The most famous of them is Old Faithful, which plays so regularly that you could set your watch by it, and forces the water more than three times as high as an ordinary hose can throw it. Then there is the Giant, which spouts seldom, but then it throws up a five-foot thick column nearly twice as high as does Old Faithful. When the Giant's companion, the Giantess, exhibits her power, a mass of water twenty feet in diameter meets the view, the noise deafens the ear, and the play may last a whole day or more."

"Why should geysers be found here?" inquires Ruth. "Because" says the obliging captain, "not long ago, as geologists count time, a flood of melted rock or lava spread over most of this region. Deep down in the rocks still abides some of this lava heat, which makes these natural fountains play to entertain and instruct us. More than three thousand hot springs, pits of boiling mud, and holes from which come breaths of gas, show that beneath the surface plenty of heat remains. You may drink, if you choose, at springs whose sulphur water, though it is good for you, will make you hold your noses, or you may select a cool spring charged with carbonic acid gas until it resembles soda water."

Yellowstone Lake and Canyon.—Next day, after a night at a comfortable hotel, we reach a large blue lake, bordered

with snow-capped mountains. The sun is hot, and this ripply Yellowstone Lake looks not only beautiful but inviting. When Jack dips his hand into the water, however, he gives



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The falls of the Grand Canyon of the Yellowstone seen from Artist Point. They are nearly twice as high as Niagara Falls. Following the river upward above the falls, what would you find?

up thoughts of a swim for the lake is nothing but ice water from the melted snows of the surrounding peaks.

To make up for the disappointment, we take a boat, and

while the girls enjoy the scenery, the boys catch a string of fine trout, which a friendly waiter at the lake hotel promises to have cooked for our breakfast. We can now say that we caught trout in the highest lake of its size in North America. A few feet out in the lake is a mound in which is a hot spring. On the mound is a fisherman. As we look he catches a speckled beauty, swings it around, and drops it into the hot spring. Thus he can tell on his arrival home that he caught a fish and cooked it without moving from his place. "I wonder," laughs Alice, "if his friends will believe him?"

From the outlet of the lake we follow the clear Yellowstone River until it falls a hundred feet, then rushes on to Grand Canyon. A path leads us through pine woods to Inspiration Point. As we look down, almost beneath our feet, a quarter-mile below, the current foams. Straight before us upstream a white cataract twice the height of Niagara falls out of the gorge. The steep canyon, twenty miles long, is a mass of colors. Reds, yellows, and greens streak and spot the walls, while the blue of the sky makes a wonderful background for the white descending water. So much yellow shows in the rocks that it gave the Yellowstone River its name.

Animals in Freedom.—Filled and almost tired by the sheer beauty of the scene, we are ready for some lighter spectacle. "See the bears fed," is the advice of a fellow tourist; so near evening we follow the men who take from the hotel the remains of food and leave it on a hillside. Out of the woods, come one, two, three, a dozen big furry bears, then a mother bear with two chubby cubs. They paw over the refuse to get dainty bits, and growl at each other a little, but the rest are careful to give fierce old mother bear plenty of room. Finally satisfied, they all go off into the darkening woods to sleep.

In few other spots of the United States could a visitor

see large, wild animals enjoy themselves in complete freedom. The guardians of the Park allow no rifle to be fired unless by the rangers of the Forest Service, who keep down the mountain lions that prey upon the game. Consequently the visitor who is willing to go off the main roads and quietly watch will be sure to see herds of antelope or elk, feeding untroubled. Guides will show him groups of shaggy buffalo with eagles flying overhead. It is worth while to go back to nature for a whole summer in Yellowstone.

QUESTIONS AND SUGGESTIONS

1. How large a part of your own state would Yellowstone Park take up?
2. How could tourists spoil a beautiful park?
3. How does a volcano resemble a geyser?
4. Why are mineral springs apt to be found near geysers and volcanoes?
5. If part of your state were made into a national park, what wild animals would be found in it?

CHAPTER XXXIX

COPPER AND GLACIERS

A Hill of Metal.—Leaving Yellowstone Park by its northern entrance, where are the Mammoth Hot Springs, we find ourselves in Montana. Though “Montana” means mountains, the plains take up about two-thirds of this big state, which comes next in size to Texas and California. Passing westward a short distance we arrive at the city of Butte.

A “butte” (pronounced bewt), is a hill or mountain which rises steeply from a level surface, and here at Butte, high up in the mountains, is a steep granite hill through which run thousands of veins of copper. This coppery hill has created Butte, and so valuable is the copper in it that Butte is now the largest mining city in the West.

Butte is not a beautiful city. When the ore was roasted to drive off the sulphur it contained, the fumes killed grass and trees all around the works, leaving the landscape bare and desolate. A better process has now been discovered; the sulphur gas is caught and used to make sulphuric acid, which is valuable in so many industries; but it will take a number of years to make Butte really green again.

Electricity and Copper.—We go down into one of the deep copper mines. Here we see the cars of ore being pulled out of the mine by a little electric locomotive. “Tell me, please, where does the mine get its power?” asks Jack. “From the ‘white coal’ at Great Falls on the Missouri,” comes the answer. Certainly this is a blessing to the miners, for it makes working underground easier, cleaner and safer. The electric cables run along from one building to another, giving this magic force to all at once.

In the works that "reduce" the ore, it is crushed into powder by the crushing "stamps." This powder is then put through various processes which separate the rock and leave the impure copper or "concentrate" in the form of mud. A smelter roasts this dried mud and turns it into copper, which has to be still further refined before it can be used by electricians or hardware makers or shoe manufacturers. We could get along better without gold or silver than without copper.

Another National Park.—Now, still following the Continental Divide, we go north through the wild Montana mountains until we near the Canadian border. Here is Glacier National Park, half as large as Yellowstone Park. In Yellowstone Park it is the work of fire which interests us most; in Glacier Park it is the work of ice.

The lofty Lewis Mountains, named for the great explorer, pass through the Park. On their sides are dizzying cliffs where the rock drops straight to gorges far below. At their feet are lovely green valleys where the flowers spring forth in abundance at the call of the brief summer. From Triple Divide Peak start three streams. One of them leads to Hudson Bay, one to the Gulf of Mexico and one to the Pacific Ocean. The chief wonder of the Park, however, is that about a hundred small glaciers lie in the hollows of the mountain tops.

Glaciers and Indians.—A professor from the University of Minnesota is studying these ice rivers. "Won't you explain to me how glaciers are formed?" asks Fred, and the professor begins: "Wherever snow falls upon the mountain tops, year after year, in greater quantity than it melts, it begins to heap up, and the pressure turns it into ice. This ice begins to flow downward in a stream, and this stream of ice is called a glacier, from the French word 'glace,' meaning ice. Down the ravines on the mountain

side creeps the glacier, until at last it descends so far that it melts as fast as it moves. Does that make it clear?"

From the ends of most of the glaciers flow rushing rivers, born far inside the mass of ice, and white or gray with



McDermott Lake, Glacier Park. The mountain overlooking the lake is a good example of the steep, bare, sharp-pointed mountains of Glacier Park. Compare its appearance with that of Pike's Peak.

the powder which the moving glacier has scraped off the rocks in its bed. Many waterfalls mark the course of these rivers, and in the valleys ice cold lakes receive the wild streams. The park has two hundred and fifty of these blue lakes, and in one of them, cakes of ice broken from a glacier float all summer long. "How would you like to use that

lake for a morning bath, Fred?" asks Jack. "It would surely wake you up, sleepyhead."

In the Park we meet some Indians who have pitched tall tents there and are enjoying a mountain summer just as much as we. They are peaceful enough, and will let us take pictures of their babies, ponies and dogs—if we pay them well. These are Blackfoot Indians, the same that John Colter tried to avoid, and the big reservation, set aside for them by the Government, adjoins Glacier Park on the east.

QUESTIONS AND SUGGESTIONS

1. Make a sketch of Montana, showing the line between the mountains and the High Plains. Put on the map Butte and Great Falls.
2. Is copper used in your home? How?
3. Is there danger in walking over the surface of a glacier? Why?
4. What Indians beside the Blackfoot Indians have we heard of during our trip through the United States?
5. Find a description of a visit to the glaciers of Switzerland, and report on it to your classmates.

CHAPTER XL

SHEEP OF THE SNAKE RIVER PLAINS

Over the Lava Plains.—In a speedy airplane we start out from Glacier Park, soaring westward, then southward over Idaho. Below us at first lies such a rough country that not many people live there except at a few mining centres. After a time the girls are glad to see yellow wheat fields appear along the winding Snake River, which is the great and central stream of Idaho.

These fields get so little rain in summer that the harvesters can sleep out in the fields without fear of being awakened by a sudden downpour. So dry does the wheat become that "heading machines" are used; they cut off the heads, thresh them out, and leave the stalks standing, for these farmers do not use the straw. The wheat grows in fertile lava soil, for into the northwest part of our country were poured out the greatest floods of lava which we know anywhere in the world. Where rivers have cut through the layers, it can be seen that the lava is hundreds of feet thick.

Lava, when it decays, makes excellent soil, but of course even the best soil needs water for the growth of plants. Great stretches of land in Washington and Oregon are covered with lava soil, and Idaho has a still greater proportion of lava land. Along the Snake River alone, to say nothing of the Columbia, there is an extent of lava larger than West Virginia. As we fly along the canyons through which runs the Snake, we pass over many thousand square miles of these plains. They extend in a broad bare belt across the southern part of the state. Wise men think that some of the lava was being poured out while Oglethorpe was found-

ing Savannah, and it is so new that soil has not yet formed there.

Irrigation Project.—Along the Snake and its tributary rivers a number of irrigation projects have been laid out. The irrigated fields mark the plains with stretches of green; beyond them useless gray sagebrush covers the desolate land. In one place the Snake flows between cliffs which are so steep and high that water enough cannot be raised to the surrounding fields in the usual way. Therefore the river has been made to raise its own water. A dam was built, and the water flowing from it produces electric power, which pumps the water up for nearly a hundred feet and makes farms and homes possible. With some of the cheap electricity the farm houses are brightly lighted and comfortably heated.

As we fly near Boisé (Boy-zay'), the capital of Idaho, we look down and see a government dam which reminds us of the one near Cody. However, this one is considerably higher; in fact, it is one of the very highest in the world. Uncle Sam calls it the Arrow Rock Dam, and it furnishes light and power to Boisé. This city, although in an extremely cold part of the country, is favored by having natural hot water from springs in the neighborhood, and a number of office buildings are heated from this fortunate source. "Wouldn't it be fun to heat our house in that way and get along without a coal bin?" exclaims Alice.

The Sheep Herder.—Here is a whitish patch upon the plains. "Is it snow?" inquires Ruth. No, it moves, dust is blowing from it, and a queer sound comes to our ears. Yes, that is the "baa-ing" of many sheep. It is a great flock of "woollies," numbering three thousand. "Let's plane down closer," says Alice, "and take a look."

A single man is watching the sheep. Can he prevent such a large flock from straying too far? Ah, he has two pretty collie dogs, that watch with as much interest as does

the herder. We shall land and make the acquaintance of man and dogs.

"Yes, I am alone here, for my camp tender has gone to get provisions," says the herder. "This is public land, and settlers haven't come into the neighborhood yet. My sheep can pick up their living without interfering with anyone. They



Sheep on the open range. They have astonishing power in getting food from such scanty pasture. What can the herder's collie dogs do to help their master?

wander about to get their scanty fare, but Dash and Nellie here nip the legs of any sheep who gets far away from the flock and drive him back.

"At night I leave the dogs in charge and go to sleep in a covered wagon which also holds the stove for my cooking. The sheep can go for days without water, but every once in a while I drive them down to drink at the river. Sometimes

I hear the yelping of coyotes, the little yellow wolves of the plains, and then I have to be on my guard, for they like lamb and mutton very much indeed. If I can get the sights of my rifle on them, however, they will be good coyotes after that."

The Herder's Work.—As the summer sun dries up the grass on the plains, the herder takes his flock into the foothills, then up into the mountain valleys, sometimes, if he can get a permit, into a national forest. There they feed until the morning frost on the grass warns their keeper to take them down again before snow blockades them. The rancher provides sheds to shelter the sheep during the coldest months, and there, crowded together, they munch alfalfa hay.

In spring the lambs are born, feeble, helpless things which keep the herder busy seeing that they get proper care and protecting them from cold during rain. June or July is the shearing time. The sheep are usually driven to a place near a railroad station, so that their heavy fleeces will not have to be carried far; then they are relieved of their woolly coats. How funny they look when shorn, and how much smaller! A sheep's fleece is worth twice as much as its meat, so you see the wool is precious. Fred's father in Boston buys some of the Idaho wool and sells it again to the mills of Lawrence and Providence.

Sheep and Cattle.—Not many years ago the sheep men and the cattle men bitterly disputed over the western lands. Both cattle and sheep could use the same kind of country, but not together. Where the sheep had passed there was nothing left for cattle. The sharp noses and sharp teeth of the sheep enabled them to bite off the grass close to the earth; their sharp hoofs cut up the ground so that the pasture was partly destroyed, and they trod every water hole

into a mud hole. The smell of the sheep was so offensive to cattle that a cow would not graze where a sheep had walked. Therefore the cattle kings said to the sheep kings, "You shall not pass!"

Many men were killed in these "animal wars," and many a flock of sheep was chased to death over some cliff. At last, however, people found that sheep raising on the open



A summer sheep camp in the mountains. In the southwestern states most of the herders are Mexicans.

ranges was more profitable than cattle raising, and a number of the old cattlemen swallowed their talk against sheep and became owners of flocks instead of herds. As farming comes, however, cattle may increase, but sheep do not. The only states east of the Mississippi which have many sheep are Ohio and Michigan.

The Plateau States are the great sheep raisers of this country, each one of them has more than a million sheep, and most of them support two millions. Idaho is foremost among them, exceeding every state in the Union, except Texas, in her number of sheep. Much of the wool goes

to Boisé, where buyers examine it, grade it, and ship it away, perhaps to San Francisco, perhaps to Philadelphia or Boston. Maybe there is Idaho wool in your suit of clothes.

QUESTIONS AND SUGGESTIONS

1. What is the difference between wheat-raising in Idaho and wheat-raising in Missouri?
2. From what country did collie dogs originally come? Why did the Western States use collies and not other dogs for sheep-raising?
3. Find a story to tell your class about some knowing collie dog.
4. What reasons can you give why sheep-raising is more profitable than cattle-raising?
5. In *Precious Waters*, by A. M. Chisholm, read how the ranchers fought to get the irrigation water they needed.

CHAPTER XLI

GREAT BASIN AND ITS GREAT LAKES

Desert Lands and Lakes.—Presto! Our airplane has landed us in the middle of a real desert. Over us stretches burning blue sky, beneath our feet all is bare and parched. Here and there are patches of "alkali," which is mineral left when some pool of water dried away after the spring rains had ceased. Even the hardy sagebrush plants can scarcely live in the parched earth.

Waves of heat beat upon us; the air shimmers and dances like that which rises from a fire. Our lips are parched, but we must not waste the precious water in our canteens, for here water may be worth its weight in gold. Eagerly we hunt for a spring where we may refresh ourselves and camp for the night. Although it is so hot, we do not perspire, for the dry air sucks up all moisture. People who do not have experience may think we are foolish to bring heavy blankets into such a hot region, but we know that as soon as night comes the breeze will be cold.

We are now in the driest state of the Union, Nevada, which lies almost entirely in the Great Basin. This basin is truly great, for it is five times as large as Ohio. Shut in by the Sierra Nevada or snow clad mountains on the west, and the Wasatch Mountains of Utah on the east, the great Basin gets very little rain. Down from the snows of the eastern and the western ranges flow various streams, but the thirsty soil of the desert swallows most of them.

All the lakes away from the edges of the Great Basin are salt, because they have no outlets. Only by evaporating, that is drying, can water leave these lakes, and as nothing

evaporates but fresh water, the salt is left. Fresh supplies of salt constantly are brought by the streams, consequently every land-bound lake grows saltier each year. "I see why such lakes are often called 'sinks,'" says Fred, thoughtfully, "because in dry weather they seem to sink into the ground as their water evaporates."

Mining and Population.—Nevada has some farming land, but little can be raised on the land without irrigation. Reno, her largest town, is near the foot of the Sierra Nevada and gets a good supply of water so that the surrounding country is quite pretty; but most of the state is desert and will always remain so. More than one-sixth of the whole United States, a surprising amount, must have irrigation in order to raise crops.

The whole state is furrowed with mountain ranges extending north and south and cutting up Nevada into long parallel valleys, where cattle and sheep manage to live. These ranges give opportunity to Nevada's great industry which is mining. Nevada, with almost no manufacturing and with little farming, is really a big mining camp. In the whole state there are less than twice as many persons as live in Butte, or about the same number as the population of El Paso or Knoxville.

As the mines of Nevada produce more or less, or as the price of their metal changes, Nevada goes up or down in population. We fly to the southwestern part of the state, and there, out on the desert, are mining towns, such as Tonopah and Goldfield. They have no shade trees or grass, and do not seem attractive to a visitor from the land of plentiful rain and long-settled states; but they thrive from the gold and silver ore which is blasted out of the bordering mountains.

Natural Bridge and Cliff House.—From the mines we fly into southwestern Utah. Here great natural bridges, far

surpassing that famous one in the Valley of Virginia, cross the canyons of a wild and lonely land. So gigantic are these arches that horse and rider seem like insects crawling beneath. The greatest of the Utah natural bridges is called Rainbow Bridge, for the Indians believed that here a rainbow was turned to stone. This was a sacred place in the eyes of the red men, and the braves said a prayer as they



Spruce Tree House, Mesa Verde Park, Colorado. This cliff-dwelling once contained more than a hundred rooms. It was safe from attack either above or below.

passed beneath. It is yet one hundred and fifty miles from a railroad, in rough and almost waterless country, but its wonders are worth the toil of reaching it. These natural bridges are now under the care of the government as national monuments.

Eastward from the bridges of stone, in southwest Colorado, lies Mesa Verde National Park, the park of the ancient cliff dwellers. "That 'mesa' is a new word to me," calls out Jack. Well, "mesa" is the Spanish word for table and "mesa" to the Westerner means a tableland

which has been left, protected by a layer of rock, where all the surrounding land has been washed away by rain.

On the sides of this Mesa Verde or "green mesa" are canyons, and high up in the hollows of their walls were found thousands of disused houses, built by Indians ages ago. These little people, secure in their cave dwellings from enemies, peacefully farmed the valleys, wove baskets, and made beau-



Rainbow Bridge, Utah. How was this great bridge formed? As a guide to the size of the bridge, note the horse at the left of the picture.

tiful pottery. They were probably the ancestors of many of the Indians now living in our southwestern states. Long ago they left the Mesa Verde, but their substantial stone houses and towers remain for our study and our wonder.

By Jordan's Side.—From southern Utah a stage line carries us a hundred miles north through a dry country where along the way we see flock after flock of wandering sheep. At the end of our stage ride we prefer not to take the railroad, but to follow the Arrowhead Trail northward. Past

many fields of sugar beets we travel, then at last we see a clear river, the Jordan.

The Jordan leads us to Utah Lake, then it flows out again. On either side of its valleys are rugged mountains, from whose sides come sparkling streams which give their precious waters to create shade trees, orchards and pastures. In the heights to the west are the copper mines of Bingham, among the largest in the world; these mines put Utah along with Montana and Michigan in the company of copper producing states.

As we continue along the bank of the Jordan, a vast body of water comes into view. Its blue waters seem to invite us. "But what is that white crust which borders the shore?" asks ever-ready Ruth. It is salt, and this is Great Salt Lake. Seventy-five miles it extends in length, and spreads out in a width of thirty to fifty miles. Long this lake remained unknown except for the reports of the Indians.

The Briny Lake.—Many strange stories were told about the lake. As two rivers entered it and no outlet could be found, it was supposed that the water must escape beneath the surface. The Indians and trappers believed that a terrible whirlpool sucked down the water and discharged it underground to the ocean. In spite of these wild stories, Frémont, the explorer, did not hesitate to embark on the lake in a frail boat which his party put together.

As the whites paddled over the clear waters a storm arose. Salt spray dashed over the men, and soon they were covered with a snowy deposit. Their eyes smarted and their throats burned. If the boat should be upset and they should take mouthfuls of brine, they would strangle to death; but at last they reached the shore in safety, and rejoiced that they had escaped.

Here, perhaps where the explorers landed, is a bathing

resort. "Oh, let's take a swim," cries Alice, jumping up and down. "Yes, that will be a new experience," says Ruth. As we enter the water we notice piles of salt made by evaporating the brine, for this industry is carried on to a considerable extent. The lake is so shallow that we must wade out a long distance before we can swim.

As soon as the water reaches our knees, however, we notice how curiously heavy it is, for it is much saltier than the ocean. When we have gone in as far as our waists we may try floating. "Try, did you say?" shouts Fred, "the trouble is not to float!" We lie at full length, arms crossed under head, and repose more comfortably than in a feather bed, in fact, if we shade our eyes, we can go to sleep in that way. When the briny water gets into our eyes, though, we are not so comfortable, for it stings as much as sand.

The City of the Mormons.—Greatly refreshed by our salt bath, we take a train from the lake shore to Salt Lake City, twelve miles inland. This beautiful, prosperous city, the size of Nashville or Trenton, was founded by the determined efforts of the Latter Day Saints, or Mormons. Their leaders were killed and the Mormons themselves were driven out of Illinois, where their temple stood on the bank of the Mississippi River.

Under a new chief, Brigham Young, the Mormons moved across Iowa to the Missouri River. Young had read of Frémont's discoveries, and finally decided to lead a party to Great Salt Lake. When the Mormons at last caught sight of the lake, they burst forth into rejoicings; but when they reached the chosen spot, one of the three women in the party declared, "I would rather go a thousand miles farther than stop in this forsaken place." So hard was the parched ground that it broke the plows; the emigrants therefore turned water on the soil to soften it, and found that only water was needed

to make the desert blossom. This was the first irrigation project by the men of the United States.

Hardship and Prosperity.—There was difficulty and even suffering for the Mormons in making homes and getting a living. When the first grain crops were ripening, a multitude of crickets invaded the fields and began their devouring work; but as if sent by a miracle, a cloud of sea gulls appeared, swooped down upon the crickets and ate up every last one. Today there is a monument in Salt Lake City to those sea gulls who saved the day and made the city possible.

Now that we know so much of the peculiar history of this city, let us take a walk about it. We notice the fine stores, the shaded streets, the clear waters flowing along the sides of the streets. In the central square we stop to admire the imposing Mormon Temple, on the loftiest of whose high towers stands an angel with his trumpet. No one except a member of the Mormon church may enter the Temple, but we are permitted to visit the turtle-backed Tabernacle, close by. The Tabernacle is so built, partly by chance, that sounds are heard within it with especial clearness. We hear the big organ playing and find the choir, several hundred strong, at rehearsal. As a close to our sight-seeing trip we view the monument of Brigham Young, "who led his people from the Valley of Despair into the Promised Land."

QUESTIONS AND SUGGESTIONS

1. Are all the lakes of the Great Basin salt?
2. Compare the size of Nevada with that of Rhode Island. Compare the population of the two states.
3. Read Zane Grey's story *The Rainbow Bridge*, and copy the paragraph which you like best about this natural bridge.
4. How does a bath in the ocean differ from a bath in Great Salt Lake?
5. In *The Furnace of Gold*, by Philip Merrill Mighels, find how Van and his queer partners saved their Nevada claim.

CHAPTER XLII

THROUGH COLORADO TO NEW MEXICO

The Royal Gorge.—Salt Lake City is at the eastern side of the Great Basin. As soon as we pass beyond the Wasatch Mountains, which loom up so plainly in view of the city, we once more enter the real Rocky Mountain highland. Going through Colorado again, we behold the Mount of the Holy Cross, where ravines filled with everlasting snow make the holy sign as a white mark seen from afar. Then we arrive at Leadville, famous mining city, high up in the mountains, and see Mount Massive, the loftiest peak of Colorado, keeping watch over the community.

Near Leadville are the streams which unite to form the Arkansas River, and our "Denver and Rio Grande" train follows the river into a deep pass. Nearer and nearer together come the rocky walls, until there is just room enough at the bottom for river and railroad. Indeed, a path for the "iron horse" had to be blasted out along the face of the cliff, and in one place the engineers even put the track out on a framework fastened to the rock. This canyon is the far-famed Royal Gorge.

Perhaps you have heard the joke about the tree which was so tall that people had to take two looks to see the top of it. Now, as Fred glances from the car window, he really has to take an extra look, with head bent far back, in order to see the sky nearly three thousand feet above. Looking down upon us are motorists who have come through the Royal Gorge Park on the Skyline Drive. To them our train appears like a toy moving through the vast cut in the earth.



Grand Gorge of the Arkansas River, looking from the top. After leaving the headwaters of the Arkansas, the railroad crosses the Continental Divide by Marshall Pass so high that it is usually covered with snow.

From Pueblo to Pueblo.—The Arkansas leads us to our old friend Pueblo, from which point we start off southward on the Santa Fé railroad. After a time the valley of the Rio Grande offers itself as a path. We have come into New Mexico, state of irrigated fields and of vast stretches of grazing land, state of forest and also of desert. Seven great national forests cover as much area as the state of Maryland and yet take up only one-tenth of the land of New Mexico. On the other hand, as soon as a traveler leaves the fertile farms watered by the Pecos River in the southeastern part of the state he comes into a region where giant cactus plants, bristling with thorns, are the most prominent products of the thirsty ground.

We stop at the small town of Táos, where Kit Carson, Frémont's friend and guide, lived and died. Near the town on a mesa above the Rio Grande, is a curious sight. Two large buildings rise before us, built of "adobe" or dried mud, and each containing several hundred rooms or cells. Story after story, cell piled upon cell, like a beehive, with no special order—these are strange houses indeed. When the Spaniards first came into the southwestern states they found just such buildings, which were really community houses with separate rooms for each family. A whole tribe lived in one building, which was a "pueblo" or town; so the Spaniards called the Indian inhabitants Pueblo Indians.

Ancient Ways.—These Pueblo Indians are descended from the old cliff dwellers whose houses are seen in Mesa Verde Park and many another location throughout this part of the West. Living in one place, these Indians cultivated the ground, and so were more civilized and more gentle than the wild roving tribes of the Great Plains. Now most of their villages of former centuries have been left to decay, but about twenty-five "pueblos" still remain and are inhabited by ten thousand of these peaceful red men.

Most of the pueblos are in New Mexico, though Arizona has a few. We persuade an Indian to take us about this village-house. "Ladders, ladders everywhere," says Ruth wonderingly. How would you like to enter your houses by climbing up a ladder to the roof and then climbing down through a trap door? If you were Pueblo Indians you



Mount of the Holy Cross. Two ravines in the mountain, always filled with snow, cross each other to form the sign. The Spaniards thought that the mountain was actually holy.

would be used to it, for their great-great-grandfathers built houses without doors so as to make each room a separate fort.

Here are women grinding corn with a stone pestle upon a hollowed stone, or baking corn cakes in outdoor ovens. Some are weaving fine baskets, each pueblo having its special pattern; some are molding, painting, or baking pottery, for no other Indians of the United States can equal the Pueblo tribes in this art. "Where are the men?" inquire our boys. Most of them are toiling in the irrigated fields, but here come some driving shaggy, long-eared "burros" loaded down with precious firewood.

Chief Cities of New Mexico.—To the South of Táos is Santa Fé, built before Jamestown, and consequently the oldest town of the United States except for St. Augustine. Its entire title is “Ciudad Real de la Santa Fé de San Francisco,” or “Royal City of the Holy Faith of Saint Francis,” but “Santa Fé” is long enough for a name. Some of the old Spanish buildings still remain, and on the central plaza is the most famous of these—the low adobe “palace” of the governor, where a long line of Spanish officials ruled before the Americans came.

Still following the Rio Grande we come to Albuquerque (Al-bookair'-ke), which though not great in size, is the largest community in this thinly-settled state. Mining and irrigation are the reasons for Albuquerque's growth. If we went westward by the Santa Fé railroad from Albuquerque, we should pass near the immense reservation of the Navajo Indians, who wander about with their flocks and herds, yet have become skilful workers in silver and weavers of blankets which are so fine at their best that they hold water. We prefer, however, to go down the river valley still farther, in the direction of El Paso, but before reaching that city, we turn west into New Mexico's companion state, Arizona.

QUESTIONS AND SUGGESTIONS

1. What are the chief ores produced at Leadville? Is lead one of them?
2. Why is “Massive” a good name for a mountain?
3. Read the story of Coronado's Adventures with the Pueblo Indians.
4. In *Bred of the Desert*, by Marcus Horton, read the story of Pat, the horse of the great Southwest.

CHAPTER XLIII

WONDERS OF ARIZONA

Tucson in the Desert.—The Southern Pacific railroad bears us swiftly over the Arizona desert. Arizona is supposed to take its name from the Spanish “arida zona” or



The Arizona desert near Phoenix. Notice at the right the giant cactus, which sometimes grows to a height of fifty feet. Many forms of cactus, with thick skin and thorny branches, grow on the desert.

dry zone. “I certainly think that’s right,” remarks Alice, “for just see how the burning sun beats down on the dry river beds and scorches the hard soil.” Arizona prides itself on having more clear days than any other state. One hotel offers to entertain travelers free of charge when the sun does not shine.

A wind storm springs up, and soon we are covered with fine sand, which no screen can keep out of the cars. Jack makes a face. “I’ve been eating sand all day,” he groans.

"But think how much worse it would be if we were alone out on the desert," replied Fred. Many a traveler, bewildered in such a storm, has lost his way, and crazed by thirst, has perished. Now the government marks the springs or water holes, and publishes a guide to them; but even with this help, to go out into the desert is dangerous.

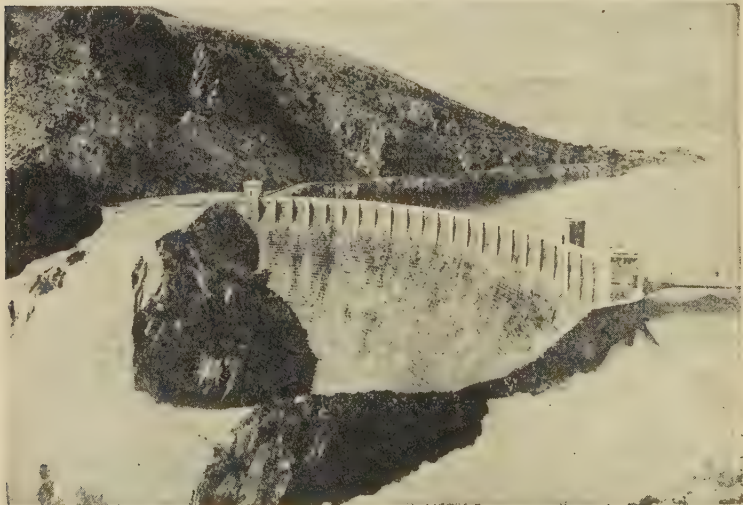
Here we are at Tucson (Too-son'), another old town founded by the Spaniards, where mountains bring a heavier rainfall than in most parts of Southern Arizona. The surrounding country supports Tucson by cattle raising and copper mining. Such great stores of copper have been discovered in Arizona's mountains that she now produces more copper than any other state, indeed, more than any foreign country. At the Desert Botanical Laboratory of Tucson earnest scientific men are trying to discover uses for the prickly, thorny plants of the desert. Already the cactus has been turned into good food for cattle, and valuable information is sure to come from this laboratory.

Salt River and Its Dam.—From Tucson we go northwest to the Salt River Valley, which shelters Phoenix, Arizona's capital. Groves of palms adorn the city, and its dry, mild air gives health to tired and worn visitors. Here are orchards of olives and oranges, making us think we are almost at the tropical regions. Far-off Akron, the automobile city, has a great interest in the Salt River Valley, for here in the dry heat is raised Egyptian cotton, which on account of its long fiber is especially good for the fabric of automobile tires.

Nearly a quarter million acres of land in the Salt River Valley have been rescued from dryness by the great Roosevelt Dam, a hundred miles from Phoenix. We drive there by the Apache Trail, so called because it was built in part by these Indians, of a tribe once celebrated for its fierceness. The Apaches of the present day have lost their wildness,

and are so honest that they are trusted to work without a timekeeper over them.

On the way we come upon fields of juicy melons, and see orchards of sweet apricots, rosy peaches, and golden dates. We pass ostrich farms where hundreds of little ostriches, looking something like baby turkeys, are running about



Roosevelt Dam. The dam is curved so as to better resist the tremendous pressure of the water. Notice the spillway on each side, to keep the water from rising too high.

Ostriches and dates seem in our fancy to go together, but if ostriches could talk, they would tell us that ostriches and alfalfa make a fine combination. Ostrich plumes are feathers which any lady can wear without feeling that these decorations were bought at the cost of cruelty to birds. "You'll see a good many more ostrich farms when you get to California," says the manager of one establishment.

The curved Roosevelt Dam holds back an enormous volume of water, thirty miles long, one of the largest artificial

lakes of the United States, but the engineers tell us that the Indians of a bygone age, probably the Cliff Dwellers, had turned the Salt River waters to such good account that they irrigated a hundred thousand acres. Many miles of their old canals may still be seen. We have improved, however, upon the old Indian work, and as we leave the dam, we think what a fine monument it is to a great man. Conservation, meaning wise use of our nation's resources, was Theodore Roosevelt's watchword, and here conservation is being carried out by the nation for the benefit of the nation.

The Canyon of Glory.—But it is time to go northward from Phoenix, past more copper mines, until we reach again the Santa Fé railroad. A branch from this leads northward still, over a plateau, until we come to a fine hotel, where we leave the train. All at once a great rift in the earth yawns before us—a rift apparently filled with mountain peaks, tossed like waves of the sea. In brightly colored slopes and walls and pyramids and castles it stretches away beyond our straining sight. This marvelous chasm is the Grand Canyon of the Colorado, the greatest spectacle in the world; so great that no eye can really take in its vastness.

Far down at the bottom of the canyon is a steep winding gorge of dark granite, and in this we catch glimpses of a ribbon-like stream, the Colorado River, which is really a rushing, angry, muddy torrent, dangerous for any boat. If the river seems so tiny from the point where we stand, how deep is the canyon? It is more than a mile straight down to the bottom, but the sides of the chasm slope so that the river is five miles away in a direct line. The opposite rim of the Grand Canyon, though it looks near, is eight to twelve miles distant in a bee-line.

This whole gigantic trench, so deep, so wide, and more

than two hundred miles long, has been cut by the Colorado and its tributaries, which are still engaged in that work. Forces within the earth pushed up the plateau through which the river now flows, but did it so very, very slowly that the waters had time to cut their path deeper and deeper downward. Rains and melting snows coursed down the sides of the deepening canyon and carved the rocks into the weird forms like old ruined temples which we see today. This is how the canyon was made, and it is only one of twenty canyons through which the Colorado flows for a thousand miles in all.

Powell the Fearless.—Less than fifty years after Columbus discovered America, a Spanish exploring party stood upon the brink of the Canyon. Some of the men tried to find a path to the bottom, but they managed to climb only one-third of the way down. "The rocks that seem only as high as a man," they said, "are taller, when one gets to them, than the highest tower in Spain." More than three hundred years passed again before white men attempted the passage through the dark trench. Then, soon after the Civil War, Major John Wesley Powell, a man without fear, led a boat party of nine men down the stream from the State of Wyoming.

Major Powell had lost his right arm in battle, and would stand a poor chance if overset and forced to swim through that whirling water, but that did not prevent him from risking the danger. For more than three months, among perils too many to tell, Powell and his party went on their weary way. Would they ever emerge from that rocky trap, far below the surface and the sunlight? Three of the men gave in to their fears, deserted, and managed to climb to the plateau above, where they were killed by Indians; but at last, after a thousand-mile voyage, Powell saw the high walls fall

away and sunshine streaming across the river. He had conquered the Canyon.

From the bronze monument to Major Powell, which stands on the rim, we may take automobiles or motor busses to many of the points which project into the Canyon. With every hour the changing of the light alters the picture before us. New beauties, new colors, new shapes appear, and other forms fade away in the shadows. The view from even one point is wonderful in its variety. When tired by such a wealth of glory we may visit the Indian camp near the station and buy curios which they offer.

Depth of the Canyon.—Of course we wish to descend into the canyon. Probably we shall take Bright Angel Trail, so called because it faces a side gorge called Bright Angel Canyon. As Major Powell floated down the river, near this point, he saw a muddy stream flowing into the Colorado and named it "Dirty Devil." Next a clear, sparkling creek appeared which he called in contrast "Bright Angel."

On sturdy mules we set off down the trail, which zigzags back and forth at an easy grade. Although in places it looks dangerous, our mules are experienced, and will take us safely down. We seem to be winding among ancient temples and monuments. Hours later we come to the brink of the river, flowing with great speed, and reddish-brown with the mud which it carries. The Indians said that the "Colorado" or "red" river came from the blood of a monster killed by a hero in far-off times. We shall see a little later the results of some of the mud.

At the end of the day, tired but triumphant, we return to the surface. It has been a day of wonders. No matter how long we stay at the Canyon, it will always offer something new for us to study. No wonder that Theodore Roosevelt said: "It fills me with awe. It is beyond comparison—

beyond description." President Roosevelt proclaimed it a national monument and President Wilson completed the good work by signing the bill which made it a national park.

QUESTIONS AND SUGGESTIONS

1. Do you prefer to live in a land of everlasting sunshine? Explain your answer.
2. What plants grow in the desert?
3. Find a little canyon in a field near your home. How does it resemble the Grand Canyon? Was it made in the same way?
4. Read in *The Young Lion Hunter*, by Zane Grey, of Ken Ward's adventures on the rim of the Grand Canyon.
5. Of what other great dams beside the Roosevelt Dam have you learned?

CHAPTER XLIV

FROM DESERT TO GARDEN

River and Desert Again.—From the Grand Canyon we motor back to the Santa Fé train and let it carry us westward until we once more meet the Colorado River at a point where the piled-up points of rock have been called the Needles. Leaving the train, we find a guide who will lead us on horseback along the river, now much more quiet than it was in the Canyon, but still strong in its flow.

The river's course makes a state boundary, but we keep to the Arizona side; after many miles of desert travel the Southern Pacific Railroad appears at Yuma, and we cross by that to California. The dryness of the Great Basin extends into the southeastern part of this big, long state and makes several deserts, separated from each other only by ranges of low mountains. There is the Colorado Desert, the Moháve Desert, and Death Valley, which deserves its name.

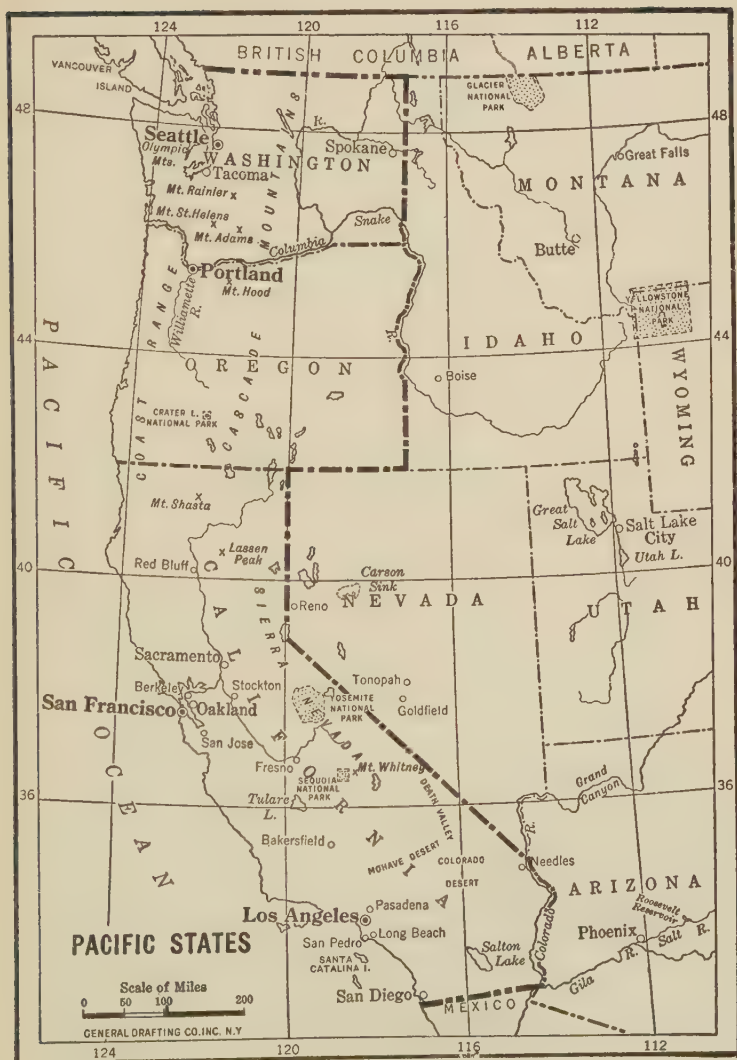
Death Valley is the lowest spot in the United States, being at the bottom nearly three hundred feet below sea level. Looking down upon the valley, strangely enough, is the highest point in the United States outside of Alaska—Mount Whitney. There is almost no water in Death Valley, it seldom rains, and the air is so dry that dew never forms. Through summer the heat in the shade goes up to 125 degrees. Many prospectors have entered Death Valley hoping to find gold, but many have found their graves. Lost in a sand storm, water gone, crazed by the scorching sun, these unfortunate men of the desert fall never to rise again.

Imperial Valley.—West of Yuma, partly in California and partly in Mexico, we come to another desert basin almost as low and almost as hot as Death Valley. It once was called the Salton Sink. The Colorado River flows into the Gulf of California, and drops there its load of mud. An arm of the Gulf extended where the Salton Sink is now. The mud dropped by the Colorado pushed out and out until at last the bay was cut off; the water gradually dried up, leaving the "sink" below sea level, stretching over an area as large as the state of Delaware.

Not many years ago a company began to irrigate the land from the reddish waters of the Colorado; but the powerful Colorado was not at all polite. One day it tore a gap through the earth banks and rushed madly down through the valley, eating away the soft soil and ruining fields and ditches. The water collected in a great lake called Salton Sea, which covered one-fifth of the valley. After immense toil, engineers blocked the river gap and saved the valley.

Now the sink is rich and green and fruitful. The Salton Sea is drying up, and the region has a new name, the Imperial Valley, a valley fit for an emperor. Under a blazing summer sun brown Japanese and brown Mexicans work in canteloupe fields, picking the yellow-green melons. These delicious fruits are put into iced cars and the cars go by thousands eastward, as far as New York. It is a profitable business, this turning of sunshine and water into juicy canteloupes.

While the canteloupe fields have proved to be gold mines, another crop occupies many times as much space in the Imperial Valley—and that is cotton. That corner of California is white in summer with the bursting cotton bolls, and the boll weevil has not come into that paradise to destroy it. There are thousands of beef cattle and dairy cows too in



this rich region under a tropical sun. Freedom from rain may be almost a blessing so long as water flows along the irrigation ditch.

The American Mediterranean.—Westbound still we go, till the Pacific Ocean spreads before us. We have crossed the continent, so we rest while in the City of San Diego, southernmost port of our western coast. Here we get a glimpse of the mountains of Mexico, and look down from the city streets upon a beautiful harbor, where Uncle Sam has a coaling station to refill his big warships when they take cruises.

San Diego lies in the region which we call Southern California, a long strip of land in the hollow of the mountains and bordered by the sea. It is not a large part of the state, but it is tremendously important. The climate of southern California is peculiar. Because this region gets most of its winds from over the warm sea, the summer heat and the winter cold are greatly tempered. The sun may be unpleasantly hot, but a few steps into the shade make a person perfectly comfortable. At Christmas it is rare to have frost. "What a delightful climate!" we all say.

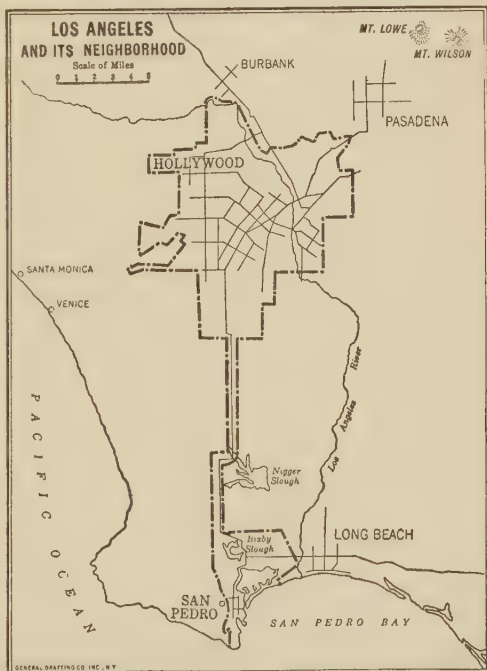
In summer, however, there is too little rain. For three months scarcely a drop falls. The hills turn yellow or brown, clouds of dust rise from the thirsty ground, and only where irrigation is carried on are there green fields. This is what we call a Mediterranean climate—winter rain and summer dryness—for most of the countries of Europe and Africa along the Mediterranean Sea have exactly these seasons.

City of the Angels.—The coast leads us northward, and there we come upon Los Angeles, founded with a long Spanish name, City of our Lady the Queen of the Angels, but shortened to "the Angels." Great orchards surround this large and beautiful city, the trade centre of southern Cali-

fornia. Fruit raising, mining, the pursuit of pleasure and of health in this all-year region have built up Los Angeles in a remarkably short time.

Twenty miles away lies the sea, and a good harbor has been made there at San Pedro, whose commerce is increasing very fast. Close to San Pedro is the seashore town of Long Beach, a city as large as Gary, whose people can enjoy the pleasures of sea bathing almost all the year. For many miles along the ocean, in fact, there is a chain of seashore settlements like that which stretches along the New Jersey shore.

Visitors to San Pedro can have a special pleasure, that of going out a few miles to the island of Santa Catalina and there viewing the bottom of the sea through the glass wells in the bottom of specially built boats. Fish of all colors swim lazily over forests of waving seaweed which are like fairy gardens in the ocean floor. Around Catalina Island the fishermen find a paradise, for the tuna and the swordfish, giants in strength, give them royal sport.



A Favored Region.—Beautiful homes are the rule in Los Angeles. The ocean brings warmth to the air of the valley and the encircling mountains defend it against cold. Remarkably mild and even is the climate, and years pass with no sign of frost. The gardens of Los Angeles are wonderful. Rain is sufficient during the winter and spring to keep plants fresh, and during the dry season water is supplied from an aqueduct more than two hundred miles long which brings pure water from the foot of Mount Whitney across the Moháve desert. Thus, palm trees, rubber trees, crimson berried pepper trees, roses, lilies and geraniums are enabled to flourish.

As the mountain water flows toward the city, it furnishes power for running trolley cars, lighting the streets and turning factory wheels. Another source of power is found in a petroleum field which has been discovered and used within the very boundaries of Los Angeles. With the seashore in easy reach, with mountains as easy to visit, with climate that invites one to stay outdoors, no wonder that Los Angeles has taken a place among the foremost ten of our American cities!

Only a few miles to the northeast is Pasadena, a city as large as Galveston. As we go there our car passes great groves of "Mediterranean" trees, trees which we always have associated with France, Spain and Italy—orange, lemon, and olive orchards, with walnut trees thrown in for good measure. Here in southern California is the most productive and valuable fruit region of our country. "Driving through this part of the country is like passing through a big park," exclaims Jack.

Golden Fruit.—Beautiful are the orange trees, with fragrant white blossoms and golden balls of fruit at the same time upon the boughs. Of course we can see that it takes several months to finish up the year's crop of oranges. Indeed,

some growers can ship oranges to market in every month of the year. Hundreds, sometimes thousands, of sweet, juicy globes are picked from one tree. The trees are kept low and bushy, so that all the fruit can receive an equal amount of sunshine and so that it can be easily picked.

California is ahead of Florida in orange production and therefore is the great orange state of our Union. Ruth



In Southern California. Oranges growing within sight of a snow-clad mountain. No other state has such great contrast in scenery as has California.

notices also the sour-juiced lemon trees along the road. In lemon raising the Californians have it almost all their own way. The pickers, mostly Japanese; who work in the lemon orchards, must be very careful, for lemons, like people of sour dispositions, need to be treated with great consideration.

Oranges, if bruised, will decay while being transported, but lemons will bruise more easily. Oranges can be packed as soon as they are picked from the tree, while lemons must be washed, dried, and stacked in trays to cure awhile before they are wrapped and boxed. The lemon tree itself is more

tender to frost than is the orange tree; so this delicate fruit on a delicate tree is confined almost entirely in this country to southern California.

The orange and the lemon are known as "citrus" fruits, and to protect their juicy pulp have a thick, oily, bitter skin. You will often find mention of "citrus fruits" in reports about California and Florida orchards. With the orange and the lemon grows another fruit which is a true Mediterranean stand-by. The traveler through the Mediterranean countries sees millions of twisted trees with leaves of a queer grayish-green color. These are olive trees, which are really vegetable cows.

Olive oil serves the Spaniard or the Italian in place of lard or butter. His food is cooked in it; he pours it on salad or puts it on bread. It supplies him with the fat which his body needs. "I like olive oil on a salad," says Alice. Perhaps you like to nibble a green pickled olive too, as an appetizer. The grocer will probably show you bottled olives or cans of oil bearing the California name. "You forgot something," says Jack, with a sly smile. "You forgot to say anything about ripe olives, and I think they're lots better than those green pickled things; but you can't get them in every grocery store."

Home of the Movies.—Beyond Pasadena we come to the slopes of the encircling mountains, which furnish precious water to irrigate the precious orchards and therefore should be kept in forest. We might take a trip up to the Carnegie observatory on Mount Wilson and look down upon a sea of waving green branches; but we must return to the "City of the Angels." Near the city we notice a string of automobiles headed toward the ocean and filled with—yes, with old-time pirates, bandanna kerchiefs bound round their heads and cutlasses at their belts. What are they doing here on dry land? Shall we turn around and make our escape? Don't

be afraid—these are movie pirates from Hollywood, out to take part in a picture.

After all, the greatest industry of Los Angeles is the making of motion pictures. The centre of the film world is



Looking north from Pasadena, California.

at Hollywood, north of the city. "Why is this?" inquires Fred that night at the "movies." The usher answers. "First, because of the warm, even climate and the abundant sunshine, the camera men can take good pictures almost every day in the year, and the actors can go through out-door scenes in comfort.

"Second, the neighborhood of Los Angeles offers scenery of almost every kind. There are mountains, snow-covered or

bare, there are rivers and forests and deserts, there are green fields and city streets, there is seashore, island and open ocean. Alaskan dog teams and Arabian camels can be shown with proper surroundings. Cowboys and sailors may easily find places to act their special parts. Where else in the world is there such a fine combination of advantages for the moving picture business? ”

The growth of the Los Angeles region has been as wonderful as that of Detroit and her district. It will doubtless continue. While the sun shines, balmy airs make outdoor life pleasant, and orchards flourish, this strip of land between the mountains and the sea will be a garden spot, drawing home seekers and tourists alike.

QUESTIONS AND SUGGESTIONS

1. Why may freedom from rain be a blessing?
2. What European countries have a climate like that of Southern California?
3. In *Winpost*, by Dane Coolidge, read how “ Billy ” saved John Calhoun’s life on the desert near Death Valley.
4. In *Merton of the Movies*, by Harry Leon Wilson, read what happened to Merton at Hollywood.
5. Make a list of the fine things which engineers have done for the United States.

CHAPTER XLV

AMONG THE GIANT TREES

The End of the Valley.—More than one hundred and fifty miles north of Los Angeles we enter the heart of California, the Great Valley, which stretches more than halfway through the centre of the state. “Won’t you tell us about this valley?” ask Jack and Fred in one breath.

The Great Valley lies between the high Sierra Nevada on the west and the much lower Coast Range on the east. From the south the San Joaquin (Hwaw-Keen) River flows through the long valley and from the north comes the Sacramento River to meet it and then to run into San Francisco Bay. Thus the San Joaquin Valley and the Sacramento Valley combine into the Great Valley, although they are often called by their separate names. This Great Valley, four hundred miles long and about fifty miles wide, is one of the famous farming districts of the world, set apart from other regions by Nature’s hand.

At the southern part of the Great Valley, where we come into it, is Bakersfield, around which is the largest of California’s oil fields. California’s wells send out much more oil than even Oklahoma produces. Fortunate indeed it is that California has an abundance of oil, for coal is scarce in her neighborhood, and though she possesses great water power, to harness this is expensive. Her locomotives burn oil instead of coal, so do many steamships on the Pacific, and so do the boilers of many factories and other large buildings, particularly in Los Angeles.

This part of the Great Valley is really a valley by itself, for Bakersfield is some distance south of the San Joaquin

River. Here the Kern River comes out of the rugged Sierra through a magnificent canyon carved deep by old glaciers, and loses itself in the marsh-fringed waters of Tuláre Lake, a lake without an outlet. Where water can be drawn by canals from the Kern River, along the foot hills, is a broad band of ribbon of orange groves. Between these and the lake, where spring floods have left rich mud, wheat is raised in plenty, if the lake does not rise and drown the fields; but west of Tuláre Lake there is little except desert.

Up to the Sequoias.—Near the lower end of the Tuláre Valley we turn off into a road which leads us to a wonderful forest on the middle slopes of the Sierra. All along the western side on the Cascade Mountains and on along the Sierras, is a belt of giant forest. It is covered in winter with a deep blanket of soft snow; it is warmed in summer by winds which cross the Coast Range and take up the heat of the valleys as they go; it is fed by countless streams.

We have reached Sequoia National Park, 150,000 acres of this splendid forest clothing rough slopes with a green garment. We find good accommodations, and then start out for a walk among the big trees which rise from the brown woods floor. Here are great sugar pines, white firs, and yellow pines that overshadow all their brothers of Georgia or Florida. They are giants, but there are greater than these.

In the midst of the huge, dull, moss-grown trunks of the pines and firs there appears a purplish column, differing from the other trees. It dwarfs even those magnificent specimens. This is the first sample of the largest trees of America, the vast sequoias. We stand beneath it and note its character.

More than a hundred feet the eye travels along its trunk before we see a branch, and then we notice that the branches with their feathery foliage droop sharply down instead of

reaching widely forth. Therefore, the tree looks like a man wearing a feather cloak and hiding his arms at his sides. If we should climb to the high summit of a pine in this grove,



The General Grant sequoia. Notice the small amount of branches compared to the trunk. Measure the size of the tree by the man standing at its foot.

we should see this sequoia pushing up through the tops of the other trees, and towering above them.

Largest and Oldest.—These trees have come down to us in their present form for long ages; their remains are found preserved in rocks which were made in the times before man existed. Now they survive nowhere else except in California.

Scattered along the west slope of the Sierra, they stand for a distance of two hundred and fifty miles. In certain places the sequoias grow in groves, but often they live like kings in the midst of less important trees.

We seek out the largest sequoia of all, named General Sherman, the biggest living thing on earth. Six men, each with a reach of six feet, would have to touch fingers, spreading out their arms to equal the thickness of the trunk. The distance around the trunk, as you doubtless know, would be more than three times that length. Nearby is the Abraham Lincoln tree, somewhat smaller, and the William McKinley tree, taller than the Sherman, but much more slender. "They make me feel like an ant running around in this park!" exclaims Ruth.

In this one grove of the park alone there are several thousand enormous sequoias and many small young ones. Strangely enough, these gigantic trees grow from very tiny cones. A botanist who was guided by Indians to a sequoia grove in early days wanted specimens of the little cones, so he aimed his gun to shoot some from the high branches. The Indians prevented him by force, for they held the sequoias as sacred.

Monuments of Time. Roosevelt Park.—Not only are the sequoias the largest living things, they are also the oldest. John Muir (Mew-er) explorer and describer of the Sierras, spent a day carefully counting four thousand rings in the trunk of one fallen tree, each ring a year's growth. According to that age, the tree was born when Moses asked Pharaoh to let the Israelites go out of Egypt. Exactly how old the General Sherman tree is, no one can tell without cutting it down. "And that, I hope, will never be done," says Alice firmly. Anyhow, the best observers say that it probably has seen thirty-six hundred years. Perhaps it may live for a

thousand years still, while changes in the world take place of which we cannot dream.

North of Sequoia Park is its little neighbor, General Grant Park, which is but four square miles in area, but protects another sequoia grove. This General Grant Park would be a part of Sequoia Park were it not that some privately owned land stretches between. Here is "General Grant," another forest giant, nearly as large as General Sherman, and near him stands "George Washington."

It is now planned to extend Sequoia Park into a far larger wonderland, Roosevelt National Park, an area one-third greater than Delaware, rugged and grand, lying along seventy-five miles of the Sierra deserts. It will extend ten miles south of Mount Whitney, and will fitly commemorate our manly President who so loved the camp and the trail.

The Story of Sequoyah.—As we turn from the immense sequoias, our guide tells us why the name was given. Among the Cherokees of Tennessee, before the Revolution, was born a boy who was half white and half Indian. By the whites he was called George Guess; but his Indian name was Sequoyah. When Sequoyah grew up he became a fur trader, and he was also a skilful maker of silver ornaments.

The Cherokees were an intelligent tribe, but Sequoyah was of keener mind and deeper thought than his fellows. "Why should the white man be superior to us Indians?" he said. At last a chance argument made him consider, "It must be the power to read and write. Can't Cherokees learn to do so in their own language?"

Sequoyah set to work. From an old spelling book he took various letters and signs, which he used to represent sounds. Then as he needed other signs he invented them, until he had characters enough, eighty-five in all, to represent every sound in the Cherokee language. No other Indian ever invented a written alphabet before or since.

For twelve years Sequoyah worked to make his alphabet simpler and better, then he brought it to the head men of his tribe, who approved it. Within a few months thousands of Cherokees learned to read and write their own language. As long as he lived, Sequoyah tried to lead his people into peaceful ways and to show them the benefits of education. The Cherokee tongue has almost passed away, but the good work of Sequoyah has not been forgotten. It is well that these stately red giants of the Sierra forest should preserve his name.

QUESTIONS AND SUGGESTIONS

1. Does the burning of oil to give power have any advantages over the burning of coal for the same purpose? Prove your answer.
2. What states have the most lakes without outlets?
3. What conditions make trees grow large?
4. What other Indian might deserve to have a sequoia as a memorial?
5. What parts of our country have no good forests?

CHAPTER XLVI

VALLEY OF FRUIT AND VALLEY OF CLIFF

In the San Joaquin Valley.—Coming down from Sequoia Park into the lowland again, we have pursued our way northward, and here we are at Fresno, in the true San Joaquin Valley. The climate of the Fresno district is very much like that of the Los Angeles district. There is the same freedom from frost and snow, the same dry summer, and therefore the same need for irrigation.

Near Fresno we see fields and fields of grapes. These are not like the grapes raised along the Great Lakes; they are more solid and meaty; they are of European stock, while the Eastern grapes come from American vines. Some of them will be shipped to the Eastern states, for, being solid, they stand the long journey well; but most of them will be turned into raisins.

Sun Kissed Grapes.—Nowhere else in the United States is there a region of such good facilities for raisin making. It is a land of rich soil brought down from the mountains, a land worth living in, yet a land with a dry summer. The grape vines send their roots deep into the ground, searching for water. When the grass is brown and dead, the vines keep right on growing. Vineyards and orange orchards can border each other, and yet all the precious irrigation water can go to the orange trees.

When the grapes ripen the bunches are carefully picked ready to be dried into raisins. Since many persons do not like seeds in their raisins, some varieties of grapes have been bred so that they contain no seeds. Unfortunately, as the seeds disappear some of the juice of the grape disappears

too, so instead of seedless grapes most growers raise the ordinary kind, and machinery removes the seeds very well.

To change the grapes into raisins they must be put on trays and left in the sun for nearly two weeks. Rain falling on them during this time spoils them, and in the Eastern states such drying would be impossible, for we could not count on two weeks without rain. After this sunbath the



Drying peaches in California. After being halved and stoned, the fruit is put upon shallow trays and exposed to sulphur smoke. This helps to color and preserve it; it is then exposed to dry on the same trays.

trays are stacked up under cover for several weeks more while the clusters dry still further; then the sweet raisins are ready for our use.

Peach and Prune.—North of the raisin district we come into the peach district. Mile after mile stretch the orchards of bushy little trees. The peach is a lover of sunshine and in California it has discovered a fine home. Here in the Great Valley there is little damage of the buds by cold weather in spring, so a good crop is almost certain.

The peach grower chooses for his orchard various kinds

of peaches which do not ripen at the same time; thus from July until October the pickers can keep on with their work. In years when the Eastern crop is scarce the California peaches can find Eastern markets; otherwise most of them must be dried or canned.

There is another fruit which is the greatest of all dried fruits, and that is the prune. This is really a plum, but it is a special kind, for most varieties of plums will not dry properly, but will rot. Though there are many prune orchards in the San Joaquin Valley, the prune centre of the United States lies in the Santa Clara Valley which lies within the Coast Range. There in April the prune blossoms make the valley a sea of white.

California has more prune trees than any other kind of fruit trees. Next in importance come peaches, and a close third we find oranges. Not very many years ago our finest dried prunes, raisins and apricots came from abroad, but we now supply other nations from the abundance of the giant states on the Pacific Coast. "Half a year of clouds and flowers, half a year of dust and sky," in California suits the men who furnish fruit dried beneath the heaven's blue.

California Canneries.—Up and down the San Joaquin Valley in the midst of this abundance of fruit, are scattered factories that save for us most of this delicious, healthful food and make it possible to raise so much. When Nicholas Appert, a Frenchman of Napoleon's time, discovered the way to seal food in jars and keep it from spoiling, do you think that he foresaw the tremendous value of his discovery? What a variety of good food canning has given to our tables! The peach, as we know, is the greatest of canned fruits. Look at the cans of peaches in the corner grocery and see if they did not come from sunny California.

It is easy to start a canning factory, for the machinery is simple, most of the labor is done by women or even boys

and girls, whose wages are not high, and the building need not be expensive. Moreover, the canned goods will keep from one year to another. Where a good crop grows, there comes the cannery. So sure and so great are the irrigated crops of this land of sunshine, that California



Bridal Veil Falls, at the entrance to Yosemite Park. On the left is El Capitan, on the right the Cathedral Rocks.

produces almost half of the canned fruit and vegetables of the United States.

To Yosemite.—The valley is hot in the summer sun which is ripening the fruits, as from a point about fifty miles north of Fresno we take a Southern Pacific train and ride upward toward the mountains. The orchards are left behind, grassy slopes, mountain brooks and forests soon appear, and we catch sight of a small river. When the track comes to an end, an automobile takes us onward through the woods.

Soon we come to a narrow valley, and Yosemite National!

Park welcomes us. We are at the entrance of Yosemite Valley, a narrow gash in the Sierra Nevada cut by a stream and still farther carved out by a glacier. It is eight miles long, and only a mile from wall to wall in its widest part. Once the bed of a lake, the floor of the valley is level, and through it wanders the Merced River, past grassy meadow and grand forest.

This valley is confined between towering granite walls. At the left of the entrance is a huge headland which rises straight up three thousand feet above us. This is El Capitan, "the commander." We look to the right, and there, from lower cliffs, gushes a small stream which drops nearly four times the height of Niagara. As it descends, the mountain breeze catches the water and blows it into a delicate mist like the finest lace. No wonder that this is called Bridal Veil Falls. What a marvelous gateway the Yosemite Valley offers!

We enter, and farther up the valley to the left we spy another waterfall. Never have we imagined any that has such a plunge. A giant descent as tall as nine Niagaras then after a short passage another drop of two more Niagaras—these make up Yosemite Falls, the highest in the world, almost half a mile of falling water. So far is it from our point of view to the brink of the falls that the eye is deceived, and the water seems to settle slowly instead of dropping with ordinary speed.

Grizzly Bear Valley.—On the opposite side of the valley a needle of granite rears itself like the spire of some old cathedral—it is Sentinel Rock. At this point is Yosemite village, where centre the valley roads and the hotel life and the stores. We may camp out, if we choose, farther up the stream. Some families live here in their own tents summer after summer. "That would suit me first rate, next year," observes Jack.

There are many other high falls beside the two we have noticed but none so high as Yosemite Falls. There are many other cliff points beside the two we have mentioned, and some are higher. A tremendous rounded mass of granite, split through the centre, is often compared to a hooded monk and bears the title of Half Dome. It rises nearly five thousand feet above our chosen camp. Farther up the valley is Clouds Rest which soars a thousand feet above Half Dome's summit, and is almost as high as the Grand Canyon of the Colorado is deep.

Yosemite Valley was not known to white men until some militia, pursuing raider Indians, came upon it in 1851. Then its wonder soon brought world-fame. Its name means "Grizzly Bear," though those powerful beasts are now almost unknown in its neighborhood. The valley is only a small part of a large National Park which is almost as big as Glacier Park, but few tourists go beyond the valley itself. From Yosemite Park a trail leads along the crest of the Sierra to the top of Mount Whitney. It is fitly known as the John Muir trail and honors the memory of that hardy explorer of the Sierras. He loved those "snowy mountains soaring into the sky," searched out their secret places and celebrated their beauty. Yosemite will always be associated with his name.

QUESTIONS AND SUGGESTIONS

1. What names of various kinds of Eastern grapes show you that they are of American race?
2. What dried fruits can you find in the nearest grocery-store? What labels are on them?
3. What canned goods does your mother buy? Make a list. Which of them came from California?
4. From the description given, draw a sketch map of Yosemite Valley.

CHAPTER XLVII

SAN FRANCISCO AND ITS NEIGHBORHOOD

The Headland City.—Turning our backs upon canyon and waterfall and fruit-abounding valley, we take a Southern Pacific train which bears us on until a great bay appears to our right. A few miles more and we are in San Francisco, the second great city of California. "Tell us something, quick, about it!" exclaim Jack and Fred. Well, the city stands on a rocky, hilly peninsula between bay and ocean. Here the Spaniards built a fort and here the Franciscan brothers set up a mission. When in 1848 the Mexican War gave us California, the name of the little Spanish settlement changed from Yerba Buena, "Good Grass," to San Francisco, the city of good Saint Francis.

With California's growth San Francisco has become great; it is the same size as Buffalo, but because there are fewer great cities in the West, and because of its importance



in history, San Francisco is more in the public eye. It occupies a most picturesque position. Let us go up to the top of one of its hills and look about us.

Passing over Telegraph Hill and Russian Hill, Ruth selects Nob Hill, for the queer name attracts her. "Why was it given?" she asks. In the old days, millionaires such as Mark Hopkins, Leland Stanford, and James Flood built costly mansions there, freely spending the money which mines and railroads poured into their pockets. Street boys spoke of these rich men as "nobs," and thus the name of the hill arose.

Looking from Nob Hill.—From this elevation we look westward. There we see Golden Gate Park, at whose farther end the Pacific dashes against the cliffs. Northward is another peninsula much like the one which San Francisco covers, and a narrow strait divides the two headlands. This is the famous "Golden Gate," named so by Frémont, who dreamed that through this passage, less than a mile wide in its narrowest part, would pass the wealth of Asia and of America. On the peninsula to the north rises Mount Tamalpais (Tam-al-pah'-is), on whose western slopes are the beautiful Muir Woods, a national monument protecting splendid groves of redwood trees, which are cousins of the sequoia.

The Golden Gate leads into San Francisco Bay, which though not nearly so large as the Chesapeake, is still great and important. Within it a vessel may sail in a straight line for forty miles, and San Pablo Bay on the north adds ten miles to that distance. On account of the high land which borders the bay and of its narrow entrance, this harbor is much better protected from storms than is Chesapeake Bay. For eight miles along the bay stretch the wharves, docks, warehouses and factories of San Francisco City.

The bay cuts off from the city all railroad lines except

those from the south, and most of the passengers coming from the east must be carried for a considerable distance on a ferryboat. They all land at the same ferry building, from which Market Street stretches toward the southwest. Market Street is the chief business highway, and to find the best



San Francisco and the Bay. Notice the hilliness of the city. Alcatraz Island lies in the waterway.

known buildings we do not need to go far from it. So hilly was the district north of Market Street that at one time it was thought the city could never grow in that direction; but when cable cars were invented they easily brought passengers up the steep grades, and now some of the most troublesome hills have been cut down.

Beautiful Park, Bracing Climate.—Sight-seeing busses will take us out to Golden Gate Park, which does not touch the Golden Gate at all. It is well worth seeing, however, for out of a waste of sandy soil skilful landscape gardeners have created a semi-tropical bower of beauty. At one point on the ocean big sea lions, half wild and half tame, love to sun on the rocks their glistening dark bodies.

It is afternoon when we visit the park, and before we have finished inspecting the tennis courts, the baseball diamonds, the athletic stadium, the children's playground, the zoo, and the museum, the blue sky is hidden by a heavy, damp fog which comes rolling in from the Pacific. Many of the summer days are visited by these fogs, which are a feature of San Francisco climate. Even while the people of the Great Valley are suffering with the heat, the San Franciscans can be cool and comfortable. There is a snap to the ocean breeze which makes people active for sport and for business.

San Francisco, though it has the rainless summer of Los Angeles, does not have the same winter warmth. Yet there is little snow; perhaps one winter out of three may bring some white flakes, but not much then. Palms and other plants which we associate with Florida grow well in the open air. In winter, however, seekers for health prefer Los Angeles, which then has the comfort of Florida weather.

Commerce. An Important Neighbor.—Naturally San Francisco has a large trade with the countries lying along the Pacific. From Oriental countries comes the jute of India, used to make bags, the tea and rice of China and Japan, and many another product. From the Hawaiian Islands, in the midst of the big ocean, many steamers bring cargoes of sugar for San Francisco to refine. So many Orientals live in San Francisco that she has a larger "Chinatown" than that of any other American city.

From our knowledge of California we can imagine what products the city finds to export. As the Oriental countries become richer the commerce of San Francisco will increase. The Panama Canal is so much used now by ships from the Golden Gate that the railroads across the continent complain they are losing freight.

Around this port, with more than a half million people, centre as many more. Six miles directly east across the bay



The Golden Gate, looking out to sea. Through this channel passes all the Sierra Nevada water which flows into the ocean. How else would it get into the sea?

is Oakland, the terminal point of several important railroads. It is also a manufacturing city, nearly the size of St. Paul. The refining of oil from California's wells is a large industry. Many of the business men of San Francisco have homes in Oakland.

Seats of Learning.—Adjoining Oakland is Berkeley, named from an English bishop who gave up a life of ease and a large income to come to America in order to educate preachers for the colonial churches and missionaries for the Indians. Impressed even in that early date with the glorious

future of America, he wrote the immortal line: "Westward the star of empire takes its way." No wonder that this growing city of Berkeley, far in the West, in a region which Berkeley never knew, should be a memorial to the name of this good man and wise prophet.

Berkeley looks out from her hills through the Golden Gate. Though the city has considerable manufactures, she is best known for her educational institutions, chief of which is the University of California, offering wonderful opportunities for study along a great variety of lines, free of charge to natives of the state. Would not Bishop Berkeley have rejoiced to see his beloved educational ideas carried on and developed beyond his wildest dreams?

The University has an out-of-door Greek theatre, built of marble, in which there are performances all through the year. If a California student wishes to write something really worth while on the history of the Pacific Coast, it will be necessary for him to consult the manuscripts and old books in the library of the University. If he wishes to study the starry heavens, he must still use the University property, but he must go to the other side of the bay, San José (Ho-say') where from Mount Hamilton the great Lick telescope looks through the clear air. James Lick, a successful miner, gave to the University nearly three-quarters of a million dollars to buy a telescope which should surpass any other in the world.

Not far away is Stanford University, whose founder, Leland Stanford, having been Governor of the state and United States Senator, established this institution in memory of his son who had died. The great Stanford estate of eight thousand acres was given to the University, which is built in the quaint style of the old Franciscan missions.

The country surrounding San Francisco is interesting and beautiful enough to repay a long stay and many excursions.

QUESTIONS AND SUGGESTIONS

1. What cities with Spanish names have we visited in our trip? In what part of the United States are they? Why?
2. Read in *Gold*, by Stewart Edward White, of San Francisco in its early days. What ideas does the story give you?
3. What are the chief articles which San Francisco would export?
4. Explain the meaning of Bishop Berkeley's famous line. Is it true?
5. In *Mary in California*, by Josephine Comstock, read about the many interesting experiences of Mary and Trix in the Golden State.
6. Why is clear air needed for observations with a telescope?

CHAPTER XLVIII

IN THE SACRAMENTO VALLEY

Little Holland.—A small steamer lies at the San Francisco wharf, ready to take us on a voyage up-state. We hurry on board, and with smoking stacks the boat puffs her way north into San Pablo Bay. Then, turning east, she enters a strange country—the delta which the San Joaquin and the Sacramento Rivers have built where they join.

Not many years ago this delta was a trackless swamp, where gunners paddled their boats among the muddy islands, hunting for wild ducks and geese. On the islands grew bulrushes or tules (toó-lees), taller than a man's height, so this was called the tule country. Once upon a time Holland may have looked like that before her engineers made dry land out of marshes.

The clever engineers of America went to work upon the tule lands. With big dredges they cut ditches to drain the soil. They piled up the black mud from the ditches into dikes which kept the islands from being overflowed in the spring freshets. They pumped the water out of the drainage ditches back into the rivers. Now they have made a new Holland in the heart of California. Hearing about this, Fred and Jack almost make up their minds to be engineers too.

On this tremendously rich river soil, "the meltings of mountain and valley," a great variety of vegetables are raised cheaply, because no fertilizer is needed. Near Stockton on the San Joaquin River are great potato fields which supply San Francisco and Los Angeles. Onions and celery add to the delta's crops. Gangs of men numbered by a hundred at once, many of them being Japanese, are working in the big

asparagus fields. So pleasant is the climate that asparagus is cut in February and sent to the Eastern markets. When later in the season the juicy stems of the Eastern fields appear, the California asparagus stays at home and its tips are canned. Nearly all our canned asparagus comes from this delta.

Marshall's Treasure Find.—Going up the Sacramento River from the delta we pass many fields of water-loving rice, and on the higher ground, irrigated peach and orange trees, as well as almond and English walnut orchards. Where irrigation is lacking, we can see some wheat fields, although in California fruit has partly driven out this "frontier grain."

At last we come to a beautiful city, rich in trees and flowers. This is Sacramento, capital of the state, equalling in size Brockton or Little Rock. It is the prosperous trade centre of the large valley in which it stands. While yet the Mexicans owned California, Captain Sutter, a pioneer Swede, secured a grant of land and built a fort at this spot. The Americans came. Sutter, in 1848, contracted with two of them to dig a mill race up in the Sierra foothills, on the American River which at Sacramento flows into the Sacramento River.

While the Yankees were digging away, one of them, a New Jersey man named James Marshall, found some yellow grains and lumps, and he was sure this was gold. He hurried off to Captain Sutter to find out, and returned with the news that gold it was indeed. The next year began the gold rush of the "Forty-niners" to California. Their covered wagons creaked over the plains, through the mountains, past Salt Lake and came down into California at Sutter's Fort. It was gold that settled California and put a new star on our flag.

Poor Captain Sutter who had helped Frémont and many another American, lost his vast estate and his great herds, and lived during the rest of his life on a moderate pension

from our government. The statue of James Marshall now overlooks the valley, and his hand points to the old mill race where he found the treasure, and near which he died, alone and poor. California, called the "Golden State," still deserves the name, for she still leads the Union in gold mining, beating even Colorado.

Mining for Gold.—The swift Sacramento and American Rivers had brought down much ore from the mountains; as



A Typical Hydraulic Mine.

this was rolled along on the beds of the streams the rock was broken or worn away and some of the gold escaped. This, being very heavy, separated itself from the rocks and stayed at the bottom. Deposits of gravel made by the rivers and containing this gold are called placers, and the early miners of California looked for gold nowhere else. The placers are found in many places where there is no water now, even beneath layers of lava. Sometimes these gravel banks are very thick.

To wash down the gravel banks and get the gold, miners use hydraulic or water power. From some high point, perhaps far away, a stream of water is led down to a pipe like a fire hose. So great is the force of this water coming from the pipe that it could not be cut with an axe, and the stream could easily kill a man.

"Isn't that an easy way of mining?" says practical Fred. Yes, this "hydraulic mining" is easy, but it is also destructive. Much fertile farm land now lies deep under a cover of loose stones washed there by the powerful streams from the pipes. Vessels big enough to sail across the ocean once could easily reach Sacramento; now even the little stern-wheel river steamers find the water very shallow, because the river bed has been filled up with waste from the mining.

Where there is both water and gravel, water enough to form a pond, floating dredges dig up the gold gravel, wash it, take out the gold and throw the gravel behind them. Thus they move forward, floating in their little lake, working as they go. More gold is now secured by dredging operations than by hydraulic mining, but after all, the real California treasure houses of today are the veins of ore which run through the Sierras and from which came all the nuggets and gold dust that the placers contained.

Old Volcanoes.—A Southern Pacific train takes us on up the Sacramento River for more than two hundred miles until we reach the town of Red Bluff. Here we hire a motor car and go eastward to Mount Lassen National Park. It had always been said that we had no active volcanoes in the United States, but in 1914, just before the World War began, Lassen Peak, which had always been known for its boiling springs, burst out in a great eruption. Steam and ashes were cast down the mountain side, and blasts of intensely hot gas withered the trees in nearby valleys. "Wouldn't

I like to have been here then!" shouts Jack, as he tries to discover signs of another eruption.

Lassen Peak is at the southern beginning of the Cascade Mountains. The Sierra Nevada are of massive granite, lofty and noble, with jagged peaks and steep cliffs. The Cascades



Mount Shasta, a dead volcano, still showing its ancient crater.

are much lower, broadly swelling and rolling. "Not so grand but more comfortable for living among," Ruth decides.

Dead volcanoes in the shape of cones rise from the general mass of the Cascades. About seventy-five miles northeast of Lassen Peak we see Mount Shasta, an old volcano, nearly as high as Mount Whitney, and looking much higher. On its side is a big crater half a mile deep. Now the fire has given place to ice, for small glaciers lie on the mountain's bosom. There is no other peak near Shasta which approaches its height, and Shasta, white against the blue sky, is a landmark for many miles.

Northern Forests.—The Shasta National Forest surrounds this snow-capped giant, but outside the limits of the forest are saw mills which are busily clearing away the trees. We walk around in the forest, looking with wonder at the big evergreens, which grow so tall and spread their foliage out so thickly that the air is gloomy where we stand.

In southern California there are few trees on the coast mountains, for the air is dry. At San Francisco, though the rainfall is not heavy, the fogs which drift in from the ocean bring considerable moisture, and forests appear on the mountain slopes. As we go along the Pacific Coast of our country from San Francisco north the rainfall increases, and with the increasing rainfall there are bigger trees and thicker forests. Northern California is rich in forests, and logs which would be thought very large in the East are called small by the California lumberjacks.

Bordering the Pacific side of the Coast Range from below San Francisco up into Oregon, is a ten-mile-wide belt, four hundred miles in length, where grow the glorious redwood trees. Some of them are even taller than most of the sequoias, though not so thick. Back of Cape Mendocino we find ourselves in the heart of a leafy wonderland. The redwoods are not only grand and beautiful, they are very useful. The wood is light, almost free from decay and great quantities of shingles, boxes and crates are made from it, but we hope that many of these noble trees will be spared that fate.

QUESTIONS AND SUGGESTIONS

1. What fine things have we learned that engineers have done for America?
2. Which mineral would support more people, gold or coal? Why?
3. Describe three kinds of gold-mining. Which will last longest?
4. In *The Lookout Man*, by B. M. Bower, read of Jack Corey's experiences in his forest-observatory near Mt. Lassen.
5. In *The Valley of the Giants*, by Peter B. Kyne, you will learn how John Cardigan came into the wonderful redwood forest.

CHAPTER XLIX

FROM CRATER LAKE TO PORTLAND

The Caved-In Volcano.—Mount Shasta stands near the line between California and Oregon. We pursue our railroad journey north for about a hundred miles, along the



Crater Lake within the cup of Mount Mazama. You see Wizard Island lying within the crater.

Cascades, through dense forests, until we reach Crater Lake National Park. "Can't you tell us a story about this before we explore it?" asks Alice.

Many years ago while a gold hunter was riding carelessly up a mountain slope, his mule suddenly stopped. Coming out of his day dream, the startled explorer saw he had

nearly gone over the edge of a thousand-foot cliff. At the foot of the cliff was a lake, so blue that the gold seeker could not believe his eyes. It lay in a mountain bowl, five miles across, with no outlet. The discoverer called it "Deep Blue Lake," but today, because it fills the crater of an old volcano, we call it Crater Lake.

Ages ago a volcano higher than Mount Shasta lifted its head here, and poured out lava on its sides. Perhaps it weakened itself inside and left an empty space; at any rate, the top of the volcano dropped in, and after much turmoil, the fires died out. The hole into which the mountain fell became filled with clear spring water, which is the lake.

A hotel on the rim of the crater entertains us, and a motor boat takes us around the lava cliffs of the still lake. Wizard Island rises out of the water, a dead volcano within a dead volcano. It is now clothed with forest, but we land on it, and climb to the edge of its crater. The boys run down and explore that pit where once fiery lava bubbled. The Indians feared Crater Lake and kept away from the spot, but we find it a place of enjoyment.

The Willamette Valley.—As we go on from Crater Lake, the train swings westward through a tangle of mountains, and after a time we find ourselves in a wide valley which reminds us of the Sacramento. This valley, however, contains the Willamette River, which flows north instead of south, between the Cascade Mountains and the Coast Range. Our train naturally follows its pathway.

This Willamette Valley is a fertile section. On the Pacific side of the Coast Range the western winds bring in a great deal of rain, and so much grass grows that the Oregon shore is a good dairy land. Between the Coast Range and the Cascade Mountains not so much rain falls, but still there is plenty for ordinary farming. Ruth, who

loves fruit, notices lots of apple orchards and berry patches as we go.

All that part of Oregon and Washington west of the Cascades has what we call an oceanic climate, brought by the winds which blow in from the Pacific. This oceanic climate is a mild climate, with cool summers, winters that are not cold, and plenty of rain except in summer. "What do you call the climate we have in Chicago, that changes so easily from one thing to another?" asks Alice. Why, that is a continental climate; it keeps us busy suiting ourselves to it, but most of the people of the United States live in that kind of climate.

Felling the Giants.—At a little station we leave the train and ride horseback up a trail to see some of the thickest timber in the world. Hark, we hear the ring of axes, the puff of steam, and the crash of trees! "We've reached a lumber camp, I'll bet," cries Jack. Here stand enormous trees, four or five times as thick as the big trees of Eastern forests, and towering far into the air before they ever put forth a branch. These are Douglas firs, often called Oregon pine, and they produce more timber to the acre than do any other forests.

The wood of the Douglas fir is light but strong, and the timbers which can be gotten from these giant trees are so big and long that they are in great demand for big buildings and for wooden bridges. A single fir will produce so much timber that an ordinary six-room house could be built from it.

Here are two men ready to attack a forest king; Jack and Fred watch proceedings with eyes and mouth open. The trunk spreads out so far at the bottom that the lumber jacks work from boards fastened into the tree six or eight feet above the ground. Standing on these springing boards, they swing their double edged axes, and cut a big wedge-shaped

gash on each side. Then each man takes a handle of a long cross-cut saw, and back and forth they draw it, biting into the trunk, "z-z-z-z," with its sharp teeth.

Now the trunk trembles, it cracks, and down, with a dreadful crash, it comes. The branches are lopped off, a steel cable is fastened to one end, the engine puffs, and along the ground bumps the log. When it reaches the railroad track, the same cable pulls it up on a car, and off it goes to the mill. The people of the Middle West and the East often see these big logs, so big that one of them will occupy two flat cars, traveling toward the Atlantic Coast, and the sight may remind them that lumbering is the greatest industry of Oregon.

The Rose City.—Returning to the river, we take the train again passing Salem, Oregon's tree-embroidered capital. After nearly one hundred miles of travel a large city appears. "Portland! Portland! that's our port," sing the girls. What a fine city it is! The mild, moist climate favors the growth of trees, shrubs and flowers; in fact, roses bloom so beautifully, even in winter, that Portland is known as the "Rose City." We have come just in time to see the yearly rose festival in June.

The name of Portland reminds us of the Maine city three thousand miles away on Casco Bay; but the city came near being called otherwise. When it was founded, two men, one from Maine, the other from Massachusetts, competed for the honor of naming the "baby." Should the new settlement be "Portland" or "Boston." At last they tossed up a coin, and "Portland" won. Now the western Portland has grown to be nearly four times the size of her Eastern sister, and in many ways has the good qualities that have made New England famous.

Why has Portland grown so fast? Because she stands

near the junction of two important rivers. Twelve miles down the Willamette brings us to the Columbia River, which once was called the Oregon. Ocean steamships come up the Columbia a hundred miles from the sea and lie in the Willa-



Portland, Oregon, with Mount Hood in the distance. Why is the snow on Mount Hood very valuable?

mette at the Portland wharves. They carry away the lumber, the wheat, and the fruit of the two river valleys.

In the background of the city, sixty miles away, stands a snow covered peak, Mount Hood, one of the five dead volcanoes which rise up as high as Pike's Peak along the Cascade Range. There are Jefferson and Hood in Oregon, Rainier, Adams and St. Helens in Washington, each dressed

in a white mantle of everlasting snow. The rushing streams that descend from Mount Hood furnish almost all the electricity which Portland needs. How would you like to be a Portland housewife and do your cooking by electricity?

QUESTIONS AND SUGGESTIONS

1. Look at a dictionary and find how the word "crater" was formed.
2. What would you expect to see wherever there was a volcano?
3. What parts of the United States are good dairy sections? Why?
4. Describe the climate of your neighborhood.
5. In *The Voice of the Pack*, by Edison Marshall, read how Dan Failing came back to his grandfather's country in Southern Oregon on the Umpqua Divide.
6. In what ways does Portland, Oregon, differ from Portland, Maine?
7. Walter Prichard Eaton, in "Boy Scouts at Crater Lake" tells of Bennie, Dumplin and Spider on a visit to the mountain that fell into itself. Read of their dangerous descent to the lake and their skiing in July.

CHAPTER L

FOLLOWING THE COLUMBIA

The Highway and the Waterway.—The Columbia River is the great river of our Pacific Slope. About fifteen years before Lewis and Clark steered their canoes down the Columbia to the ocean, Captain Robert Gray of Boston found its mouth, which was hidden by a sand bar, and sailed in with his good ship the *Columbia*. Portland is about a hundred miles from the sea, but as we do not need to follow Lewis and Clark to the Pacific, we'll turn eastward and go toward the Columbia's source.

Our road lies along the magnificent Columbia River Highway, leading from the ocean for nearly three hundred fifty miles, wonderful as a piece of engineering and wonderful for the views along the way. The railroads pass along the river too, one on each bank, but we can see better from our car, and we don't want to miss one bit of the landscape. After traveling twenty miles from Portland through the Willamette Valley, the Cascade Mountains loom up right ahead. The mighty river has cut clear down through them to sea level, forming a gorge even finer than that of the Hudson through its Highlands.

A large steamer is cutting the water below us, heading in the same direction as we are. "How far up the river can she go?" asks Ruth. About one hundred fifty miles from the sea she will come to "cascades" or rapids, where tide water stops; but a lock and a canal will take her around this obstruction. Then she can travel fifty miles more to the Dalles or rapids of the flat stones, as the French called them, which need a canal twelve miles long to get the better

of them. After that the way is clear for two hundred miles to fierce Priest Rapids. This is not all the navigation possible on the Columbia, for steamers are traveling over it and its feeder, the Snake, as far as the boundary line between Washington and Idaho. All in all, a steamer can pass over



Crown Point, on the Columbia River Highway. Here the road sweeps round almost a full circle, to give an extensive view.

as many miles of water on the Columbia and its tributaries as there are miles of land between New York and Denver. "Columbia is surely a good name for such a great river," Alice decides.

Through the Cascades.—Now we are in the heart of the Cascade Range. Sometimes we pass through tunnels lighted by windows cut through solid rock; we come to Crown Point,

where the road sweeps around almost in a circle to give us a view up and down the river for seventy miles; but the most delightful surprise of the trip, so the boys think, is in the waterfalls. From the side valleys of the cliffs many of these white ribbons rush down. To see some of them we must leave our car and follow paths through the glens; but most of them are in plain sight from the road. Highest of all is Multnomah, falling from the height of four great Niagaras.

We are so high up on the road—it is a real *high* way—that to our right we can see Mount Hood, and to our left Mount Adams and Mount St. Helens. The Indians said that Mount Hood and Mount Adams, looking at each other across the river, were rival chiefs who fought for the hand of a witch woman, now Mount St. Helens, and all three were turned into stone by the Great Spirit. From Mount Hood flows the Hood River, whose mouth we cross. The Hood River Valley is famous for its big red apples, and the orchards spread even up the lower slopes of Mount Hood itself.

Eastern Oregon.—When we pass beyond the Cascades it seems as though we had touched a different state; indeed, we have come into a different region. The western part of Oregon and its sister state Washington is moist, while the eastern part, sheltered by the Cascade Mountains, is dry; and the dry eastern part, into which we have come, is about twice as large as the moist western part. Some of the Great Basin laps over into southeast Oregon, which has plenty of lakes without any outlets.

Most of the remainder of eastern Oregon is made up of high lava plains with some mountains. The settlers there find long dry summers and winters that have little snow but plenty of nippy air. Such land and such climate make the ranchers raise wheat, cattle and sheep. The woolly coats

of the sheep are good to keep out the winter cold, and the winter cold makes the fleeces thick. There are woolen mills in Portland to take care of the fleeces. Though not many people have settled yet in this part of Oregon, irrigation projects are planned to bring water to vast stretches of sagebrush land.

Two Interesting Rivers.—As railroads and automobile highways are not numerous in eastern Oregon, we decide to follow the course of the Columbia. The land through which we pass is much like that to the south, a country which needs irrigation. Here comes the Yakima River, flowing east into the Columbia from the Cascade Mountains. Though the Cascades take the water out of the air, they let it run down their sides, and the people of the Yakima Valley use that water to grow apples.

The water fattens the apples, the cloudless summer sky colors them, and the result is that these big red beauties are eagerly bought by Eastern cities and by the people of the British Isles. The orchard people of the Yakima Valley and farther north in the Wenatchee Valley near the Columbia are growing rich very fast from their small but precious apple farms. "Ask the price of one of these apple orchards, Jack, and see if your father has enough money to buy it," says Fred. "It might not cost him any more to buy a farm than to pay for all the apples I eat," laughs Jack.

Nearly opposite the mouth of the Yakima River the Snake, hurrying down from the Idaho Mountains and fresh from its twisting course along the Oregon boundary, joins its waters to those of the Columbia. We take a steamboat up through the lava canyons of the Snake. It is an interesting voyage. Sometimes we see real Palisades such as those of the Hudson, sometimes we stop at a peach or apple orchard, and sometimes a long wire cable brings down bags of wheat or bales of wool from the plateau above us.

The Story of the Salmon.—In the river we see men hauling nets. “What are they catching?” Ruth cries. Look close and maybe we’ll see. “Yes, there are some big silvery fish,” says Alice, much interested. They are salmon, the most important fish of our American rivers. The story of the salmon is very curious. They live in salt water, but they lay their eggs in fresh water. Every spring a multitude of



Catching a salmon with a net in the Columbia River. Fish-wheels have also been much used to catch salmon. These work by the current of the river and scoop up any unwary fish that swims into their buckets.

full-grown father and mother salmon comes from the ocean and they make their way up the rivers.

Up, up, up, swim the salmon. They are heavy, powerful fish, and with strong strokes of fins and tail they push up the rapids, resting awhile to get back their strength, but not to eat, for they had their last meal when they left salt water. Finally the mother salmon lay their eggs in some sheltered place, perhaps in a mountain lake, for salmon have

been known to reach a point two thousand miles from the sea, far up the Snake River.

When the eggs are laid, the work of the salmon is done. Then they turn and go weakly downstream, back toward the ocean; but not a salmon lives to reach the Pacific again. The young salmon hatch out, swim down to the ocean, and grow up; then they come back, swim up the same stream, and try to reach the place where they were born, so as to lay their own eggs in that spot. How do they know the stream? That we cannot tell; it is one of Nature's secrets.

As the salmon, fine and fat, come up the rivers, that is the time to catch them. The Indians of Washington and Oregon used to spear them, then smoke them and get a winter's supply of food for themselves and their dogs. Bears came by thousands from the mountains to scoop salmon out of the streams with their big paws. Both bears and Indians are growing scarce, but the white man loves salmon too, and makes a business of catching them and canning their solid flesh.

Of course the heaviest catches are near the mouth of the Columbia, but traps are set for the salmon along hundreds of miles of the river valley, and the supply is growing less. Conservation must step in and give the salmon a chance, or else this toothsome fish will disappear from the waters where it once swam in vast numbers. There are hatcheries in Washington and Oregon which raise young salmon to stock the rivers, but it is hard to put the fish in as fast as they are taken out.

Queen of the Inland Empire.—Our steamer stops at the boundary line between Washington and Idaho; then we take a train northward across the great Washington wheat fields to Spokane, the city which is the business centre of that vast area which Westerners call the Inland Empire. From the plateaus and mountains of Washington, Oregon, Idaho, and

Montana, Spokane draws trade, and so it has become as large and important as Fort Worth, Texas, or Kansas City, Kansas.

Gold, silver, copper, lead and zinc ore is found not far from Spokane, timber from nearby hills is sawed by Spokane mills, and some of the wheat of the fertile lava plains is made into flour here. The city rests in a sort of natural park, bordered by mountain slopes. The business part lies in the valley, while the homes occupy the hills. Right in the heart of Spokane are the falls which caused people to make a settlement. Beautiful drives circle the city and add to its attractiveness.

QUESTIONS AND SUGGESTIONS

1. What were the experiences of Lewis and Clark when coming down the Columbia?
2. How does the Cascade Range differ from the Sierra Nevada?
3. What advantages has the Yakima Valley for apple-growers? What disadvantages has it?
4. What Atlantic fish resembles salmon in its habits? How?
5. What makes your own city or town attractive?

CHAPTER LI

THE FAR NORTHWEST

To Puget Sound.—The Sunset Highway offers to lead us westward across Washington to tidewater once more; but we shall take a train on the Northern Pacific this time. Back through the wheat fields of the plateau, the apple orchards of the valleys, and the forests of the Cascades we go, and after more than three hundred miles of this varied travel, the conductor calls out “Tacoma!” Here the Northern Pacific ends its long road from Duluth, a main line stretching from the Lakes to the western ocean.

Tacoma looks out upon Puget Sound, with its high shores and deep water, from which rise many islands. The Sound is a drowned valley like Chesapeake Bay, and it has even more branches. On the most southern inlet is Washington’s capital, Olympia. Right in front of Tacoma are the snow-topped Olympic Mountains, between the Sound and the sea. They are in the same line as the Coast Range of California and Oregon.

Mount Olympus in Greece, the old fables tell, was the home of the gods and goddesses—Jupiter and Apollo, Venus and Minerva; but these Olympic Mountains are taller by far than that Mount Olympus which the Greek held in such reverence. Uncle Sam has preserved here a National Forest, and in it thousands of proud elk wander about safe from the hunter’s rifle. A great deal of the peninsula is just as wild today as it ever was.

Tacoma and Timber.—Returning to Tacoma, we find that it is a considerable port. Steamers sail from here directly to China, Japan, and the United States coast. There are coal



Photo from Gifford Studio, Portland, Oregon.

Felling a big tree of the Northwest. The State of Washington leads the Union in producing lumber. Can these lumberjacks cut down the tree with axes alone? Why do they stand on boards?

mines near the city, and that helps manufacturing. Ores are smelted, flour is made, goods of many kinds are brought in and carried out, but Tacoma's greatest article of commerce is lumber.

"The more rain, the more forest, I suppose," remarks

Fred. That is right, and here in the northwest corner of our country there is more rain than in any other part that we have visited. Along the coast the warm, moist winds of the Pacific bring in three times as much rain as the Eastern states consider enough for farming. The Olympics catch a great deal of this rain, but leave plenty for Tacoma and its neighborhood. Through the mild winter and the cool spring it may drizzle and sprinkle nearly every day, perhaps to make up for the dry summer season when the days are pleasantly warm but the breeze turns somewhat chilly on most nights.

Because western Washington, as we have said, has more rain than any other part of any state, it is the best forest section. Washington beats the rest of the Union in lumbering. All through the Puget Sound region we see saw mills, smell fresh cut planks, and see logs heaped up ready for operations. There in the Sound float enormous cigar-shaped rafts of Douglas fir bound together with chains, ready to be towed down the coast to California. "Oh, yes," says Ruth, "Washington is the lumber state, sure enough, and Oregon is not far behind her." Half of the lumber of the United States comes from our three Pacific states.

A Vision In the Sky.—One day at sunset, as we are walking along the streets of Tacoma, a vision appears in the eastern sky. It is a vast white pyramid, apparently seated on the clouds. "Oh, look!" exclaims Alice. "It's changing color!" Slowly the white turns to a beautiful pink, then as the sun sinks the pink fades. "Is that a mountain," is Jack's question.

"Yes, Jack, that is the most imposing peak of the United States. The Indians called it 'Mount Tahoma,' but our geographies call it 'Mount Rainier (Ray-neer')." The same year that Captain Gray sailed into the Columbia River, an Englishman, George Vancouver, piloted his ship the *Dis-*

covery, along the unknown coast north of the Columbia. On a pleasant May day, Vancouver caught sight from the sea, of a 'round, snowy mountain,' which he named Mount Rainier after an admiral who was his friend."

"Please let's go to that beautiful mountain," says Fred; and so we start off for Rainier National Park in a big automobile. Beneath dark arches of Douglas firs, and by dashing mountain streams, the car takes us. Then it enters a gateway of giant logs and climbs up and up until, where the evergreen forest on Mount Rainier's southern side begins to thin out, we jump down at the door of a fine hotel.

Glaciers Above Us.—"This is Paradise Park," remarks our driver, and Ruth cries, "Isn't that a good name? See the wonderful flowers!" Indeed, in this high valley, from which the snow melted only a few weeks ago, there are so many gayly colored blossoms that, as John Muir said, "Nature is trying to see how many of her darlings she can get together in one mountain wreath." The girls run to and fro, competing to see who can find the brightest cluster.

Above this "heavenly" valley still towers up the mountain—most of it bare rock, yet hidden in many places by fields of snow and white glaciers. Rainier has more of these rivers of ice than any other mountain we have seen. Thirty or more creep down its sides, and a half hour's walk from the hotel will bring us to several of them, which flow through the midst of the green forests.

We walk out on the rough surface of the glaciers and look far down into the blue-green depth of the crevasses or great cracks in the ice. "I wouldn't like to slip in there," says Alice, shivering, and Jack replies, "No, please don't, for I wouldn't like to go down after you." Then we all go to coast down the big snow fields close by. As we return to the hotel we meet a party coming back from the toilsome over-night trip to Rainier's summit. The climbers tell us



On the snow-fields of Mount Rainier. These hardy climbers are at the point where the snow of the summit begins to pack into ice and form a glacier.

of the jets of steam that burst out from one of the craters at the top and prove that the mountain's heat is not yet dead.

City of Lakes.—But now we must leave this wonderland of mountain glaciers and go back to Tacoma, in order to reach Tacoma's big sister, Seattle. Instead of taking the railroad or electric car we prefer the fast steamboat, which takes us by a straighter line over the distance on Puget Sound in less than two hours. From the deck of the boat the Olympics loom up in all their grandeur, and behind us, as it is a clear day, Mount Rainier's silver armor gleams in the sun.

As we approach, Seattle on her hills looks large and imposing, and we lose no time in finding some one to show us around. Our guide is a bright boy who knows his city well. "Seattle is web-footed," he says. "On one side of us is the Sound, on the other is a big lake, Lake Washington, and we have two other lakes inside the city limits. If any Seattle boy doesn't know how to sail or swim, it's his own fault. By the time I go to the University of Washington here I expect to be fit for their swimming team. Perhaps I'll get on their crew. They can row on Lake Union every day in the year, and so they turn out champions."

"Is Seattle a big city?" asks Fred. "Yes, it's one of the Big Three of the Pacific Slope," answers our friend. "And active—well, I guess! You can see that we have plenty of hills now, but some years ago we considered that the centre of the city was entirely too up-and-down. So what did we do? Why, we just tried a little hydraulic mining and washed away a couple of good-sized hills."

Seattle, being a city surrounded by forests, has a vast lumber trade, she cans salmon of the Sound and the rivers, and makes flour from the wheat of the dryer lands across the Cascades. Snoqualmie Falls, not far away, supply im-

mense power for her manufacturing. She is also a gateway to two special regions.

First, she is the nearest city to Alaska, and many million dollars' worth of Alaska gold comes to the refineries of Seattle. Next, Seattle is nearer to Japan and China than is San Francisco, so she is getting a large trade with those countries. Many cargoes of their valuable raw silk come into Seattle harbor. The silk is heavily insured, and each minute of insurance counts, so it is rushed on special trains, and across the continent to the Eastern mills they speed in the quick time of four days.

The End of the Road.—Here at Seattle ends our long journey. We have gone over the length and breadth of our land—seacoast and river, plain and mountain, field and desert. Everywhere we have found man's hand and brain turning nature to advantage. We have found each part of our country helping the rest and depending on the rest. Our country's motto is, "*E pluribus unum*," one made out of many. Is that a good motto? "Yes," says Ruth, "I can say it in another way, 'In union there is strength,'" and Alice, Jack and Fred exclaim, "We're better Americans now, since we have taken this trip through our own United States."

QUESTIONS AND SUGGESTIONS

1. Why is Northern Pacific a good name for that railroad? Give the names of two other railroads which you think well named.
2. How much rain do the Eastern States consider enough for farming?
3. Name some famous peaks which we have seen in this journey. In what state is each?
4. From an encyclopedia or travel-book find how Seattle received its name.

APPENDIX

I. PRONUNCIATION OF SOME PROPER NAMES

(Try to pronounce these names without your teacher's help.)

Ad-i-ron'-dack	Covington. <i>Cuv'-ing-ton</i>
Agassiz. <i>Ag-as-see'</i>	Crater. <i>Cray'-ter</i>
Al'-a-mo	
Albuquerque. <i>Al-boo-kair'-kee</i>	Dav'-en-port
Allegheny. <i>Al'-le-gen-ny</i>	Des Moines'
An-nap'-o-lis	Des Plaines'
Apache. <i>A-patch'-ee</i>	De-troit'
Appalachian. <i>Ap-pa-latch'-i-an</i>	Du-luth'
Argentina. <i>Ar-jen-tee'-na</i>	
Arkansas. <i>Ar'-kan-saw</i>	El Paso. <i>El Pass'-o</i>
A-sho'-kan	Ev'-er-glades
Ban'-gor	Florence. <i>Flahr'-ence</i>
Bayonne. <i>Bay-own'</i>	Florida. <i>Flahr'-i-da</i>
Beaumont. <i>Bo-mont'</i>	Fresno. <i>Frez'-no</i>
Belle Fourche. <i>Bell Foorsh</i>	
Berkeley. <i>Berk'-ley</i>	Gal-e'-na
Berkshire. <i>Berk'-shr</i>	Gal'-ves-ton
Boisé. <i>Boy'-zay</i>	Gary. <i>Gay'-ry</i>
Brazos. <i>Brah'-zose</i>	Genesee. <i>Jen-e-see'</i>
Bronx. <i>Bronks</i>	Glacier. <i>Glax'-shur</i>
Butte. <i>Bewt</i>	
Cal-u-met'	Har'-lem
Cas-cade'	Har'-vard
Champlain. <i>Sham-plain'</i>	Haverhill. <i>Hay'-ver-ill</i>
Charlotte. <i>Shar'-lot</i>	Ho'-bo-ken
Chat-ta-noo'-ga	Hodgensville. <i>Hod'-jens-ville</i>
Chautauqua. <i>Shaw-taw'-qua</i>	Holyoke. <i>Hole'-yoke</i>
Cher'-o-kee	Houston. <i>Hew'-ston</i>
Ches'-a-peake	Huron. <i>Hew'-ron</i>
Cheyenne. <i>Shi-en'</i>	
Chicago. <i>Shih-kah'-go</i>	I'-da-ho
Cincinnati. <i>Sin-sin-at'-te</i>	Illinois. <i>Ill-i-noy'</i>
Co'-dy	Im-pe'-ri-al
Colorado. <i>Col-o-rah'-do</i>	In-di-an-ap'-o-lis
Connecticut. <i>Con-net'-i-cut</i>	I'-o-wa
	Iroquois. <i>Ir'-a-quoy</i>

Kal-a-ma-zoo'
 Kan-ka-kee'
 Kansas. *Kan'-sas*
 Kat-ah'-din
 Ke'-o-kuk
 Ke-wee'-naw

Le'-high
 Llano Estacado. *Lan'-o Es-ta-
 cah'-do*
 Los Angeles. *Lahs Ang'-el-ess*
 Louisiana. *Lou-iss-e-an'-a*
 Lou'-is-ville

Mau-mee'
 Mesa Verde. *May'sa Ver'de*
 Miami. *My-am'-i*
 Michigan. *Mish'-i-gan*
 Mil-wau'-kee
 Min-ne-ap'-o-lis
 Moline. *Mo-leen'*
 Mo-non-ga-he'-la

Nar-ra-gan'-sett
 Neches. *Netch'-ez*
 Nevada. *Ne-vah'-da*
 New'-ark
 New Or'-le-ans
 Ni-ag'-a-ra

Ocmulgee. *Oc-mul'-jee*
 O-kee-cho'-bee
 Oklahoma. *Oak-la-ho'-ma*
 Omaha. *O'-ma-haw*
 Ontario. *On-tay'-ree-o*
 O'-zarks

Pas-a-de'-na
 Passaic. *Pas-say'-ic*
 Pat'-er-son
 Paw-tuck'-et
 Pe'-cos
 Pe-nob'-scot
 Pe-o'-ri-a
 Phoenix. *Phe'-nix*
 Piedmont. *Peed'-mont*

Platte. *Plat*
 Po-to'-mac
 Prov'-i-dence
 Pu-eb'-lo. *Pew-eb'-lo*
 Puget. *Pu'-jet*

Racine. *Rah-seen'*
 Rainier. *Ray-neer'*
 Reading. *Red'-ding*
 Re'-no
 Ri'-o Gran'-de
 Rochester. *Rotch'-es-ter*

Sabine. *Sah-bene'*
 Sac-ra-men'-to
 Sag'-i-naw
 San Diego. *San De-ay'-go*
 San Joaquin. *San Hwaw-keen'*
 Santa Fe'. *San-ta Fay'*
 Sault. *So or Soo*
 Sav-an'-nah
 Schenectady. *Ske-neck'-ta-dee*
 Schuylkill. *Skool'-kill*
 Scioto. *Si-o'-to*
 Se-at'-tle
 Sem'-i-nole
 Sho-sho'-ne
 Sierra Nevada. *Se-er'-ra Ne-vah'-
 dah*
 Sioux City. *Soo City*
 Spokane. *Spo-kan'*
 Staten. *Stat'-en*
 St. Augustine. *St. Aw'-gus-teen*
 St. Lou'-is
 Su-pe'-ri-or
 Syracuse. *Sihr'-a-cuse*

Tac-o'-ma
 Taos. *Tay'-os*
 Terre Haute. *Ter'-reh Hote*
 Ti-con-der-o'-ga
 To-le'-do
 Tonopah. *To'-no-paw*
 To-pe'-ka
 Tucson. *Too-sahn'*

Tulare. *Too-lah'-ree*Tulsa. *Tul'-sah*Uruguay. *Oo'-roo-gwy*Utica. *You'-tee-ca*Wabash. *Waw'-bash*Wasatch. *Waw'-satch*Waterbury. *Wa'-ter-ber-ry*

We-nat'-chee

Wichita. *Witch'-it-aw*Wilkes-Barré. *Wilks'-Bar-ry*Willamette. *Wil-lahm'-et*

Wis-con'-sin

Worcester. *Woo'-ster*

Wy-o'-ming

Yakima. *Yak'-i-maw*

Yo-sem'-i-te

II. POPULATION OF LARGEST CITIES

Census of 1920. Round Numbers Used

IS YOUR CITY HERE?

New York	5,600,000	St. Paul	235,000
Chicago	2,700,000	Oakland	215,000
Philadelphia	1,800,000	Akron	210,000
Detroit	1,000,000	Atlanta	200,000
Cleveland	800,000	Omaha	190,000
St. Louis	770,000	Worcester	180,000
Boston	750,000	Birmingham	180,000
Baltimore	730,000	Syracuse	170,000
Pittsburgh	600,000	Richmond	170,000
Los Angeles	580,000	New Haven	160,000
Buffalo	500,000	Memphis	160,000
San Francisco	500,000	San Antonio	160,000
Milwaukee	450,000	Dallas	160,000
Washington	440,000	Dayton	150,000
Newark	410,000	Bridgeport	140,000
Cincinnati	400,000	Houston	140,000
New Orleans	390,000	Hartford	140,000
Minneapolis	380,000	Scranton	140,000
Kansas City, Mo.	325,000	Grand Rapids	140,000
Seattle	315,000	Paterson	135,000
Indianapolis	315,000	Youngstown	130,000
Jersey City	300,000	Springfield, Mass.	130,000
Rochester	295,000	Des Moines	125,000
Portland, Ore.	260,000	New Bedford	120,000
Denver	260,000	Fall River	120,000
Toledo	245,000	Trenton	120,000
Providence	240,000	Nashville	120,000
Columbus, O.	240,000	Salt Lake City	120,000
Louisville	235,000		

Camden	115,000	Fort Worth	105,000
Norfolk	115,000	Spokane	105,000
Albany	115,000	Kansas City, Kan.	100,000
Lowell	115,000	Yonkers	100,000
Wilmington	110,000	Lynn	100,000
Cambridge	110,000	Duluth	100,000
Reading	110,000	Tacoma	100,000

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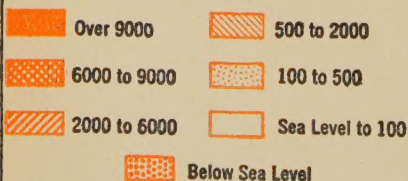
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D O M I N I O N

P A C I F I C
O C E A N

HEIGHTS IN FEET



M E X I C O

Scale of Miles

